

DR. Hamed

# STDs

Any Lee -

- |                                       |                             |
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# Introduction

## A Terminology:

### • Veneral Disease, STDs, Genitourinary Disease

group of Diseases of which main mode of Transmission is by Sexual activity

→ main sites of contact :- are the interfaces

Between the moist mucous membranes and

the Skin :- penis, Scrotum → males  
vagina, Cervix → Female  
Mouth, Rectum → Both sex

→ Non Sexual mode of Transmissions:

3 Routes 1- Skin + Eye Contact :-

- Inclusion Conjunctivitis
- Ophthalmia neonatorum.
- Scabies • Pediculosis

2 - Transplacental spread :-

- Congenital Syphilis
- Syphilis in the innocent

3 - Blood Transfusion: AIDS.

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### • The First Name: Veneral Disease

→ the Oldest

→ main defect in this name is it was misleading → it gives the impression of Disgust & infidelity, it couldn't describe a disease Between husband and wife

### • 2nd name STDs.

→ more correct name.

→ main defect in this name is that it is a descriptive term for the behaviour.

### • 3rd name Genitourinary D

- describes an anatomically derived group of Diseases Rather than a Behavior dependent Diseases

## B History :-

① 3 important milestones in the History of STDs

① there is evidence that STDs are among the Oldest Diseases of humans and anthropologic studies.



- Showed Bone changes similar to that of syphilis in the pre historic humans
- Records of Venereal Diseases in form of genital Chancres followed by → Skin Eruption early as 3000 B.C. - علاج

② important period (1943 - 1976)

Due to → Dramatic and major changes that occurred during that period.

1943 → Penicillin introduced for the of syphilis e' great hope for eradication

1950 → this hope → Confirmed and expressed By the Removal of term

"Syphilology"

1960 → Radical change in sexual behavior with sexual Revolution

- ↑ permissiveness and presentation of STDs as trivial curable Disease.

all these factors leads to → ↑ incidence of STDs

②

③ the worst milestone was in 1981 → with appearance of the fatal acquired Immunity deficiency disease AIDS

## C Spectrum:

Include 3 microbial groups ← Bacterial  
Viral  
Fungal  
3 Parasitic groups  
→ arthropods  
→ Protozoa  
→ Helminths

## A Bacteria:

- N. gonorrhoea → Gonorrheal disease
- Chlamydia Trachomatis
- Ureaplasma Urealyticum
- Mycoplasma Hominis
- Gardnerella Vaginalis
- Anaerobes
- Group B streptococci → Neonatal sepsis
- T. pallidum → Syphilis
- H. Ducelegi → Chancroid
- Chlamydia Trachomatis → Lymphogranuloma Venereum
- Shigella → Shigellosis



## ★ Viruses :-

- HSV → Genital Herpes
- HIV → AIDS
- Hepatitis Virus → Hepatitis
- pox virus → Molluscum Contagiosum
- Papilloma Virus → Genital warts
- CMV → Abortion  
→ Congenital infection

## ★ Fungi :-

Candida albicans → Genital Candidiasis

## ★ the parasites group :-

### ★ Arthropodes :-

- Sarcoptes scabiei → Scabies
- Phthirus pubis → Pediculosis

### ★ Protozoa :-

- Trichomonas vaginalis → Trichomoniasis
- Entamoeba histolytica → Amoebiasis

## ★ Helminths :-

- Enterobius Vermicularis → Enterobiasis
- Strongyloides Stercoralis → Strongyloidiasis



# Epidemiological Aspects of STDs

## Epidemiology:

study of prevalence, incidence of a disease or group of diseases, Factors affect them and prevent them.

## Prevalence Rate:

- number of the present cases of disease in a particular population during a particular time. per 100,000 population.

## Incidence Rate:

- number of New cases of ....

## \* Study of 4 Points:

- Host
- environment
- the agent
- prevention-control

## A. Host Factors

### a. Personal Factors:-

1. Age: • The potential in acquiring STD is Highest in age group (18-35 yr)

#### • special observations:-

- earlier age of first coital experience Before age of 16 yr → more liability for STDs

- The early age of sexual experience. explained By :- Early puberty Due to → improved nutrition  
Search for sexual practice. → Early work → gaining money

- Higher incidence of Complications of STD as:- Pelvic inflammatory Disease (PID) in the teenager females as compared to age (20-24) yr.



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## 2. SEX:

### • General Rules:

- acquiring STD is Higher in males than females
- explained by less sexual activity and mobility of the female compared to male.
- late or difficult Recognition of the genital lesions by the female

• Contact tracing for the female partners of the infected male is not present in many societies. That don't accept that the female can be examined for genital complaint.

### • Specific Observations :-

↳ in UK - USA → there is ↑↑ incidence of gonococcal infections in the female by 400% during 1955-1987

↳ many STDs can be transmitted more efficiently from males → females than the reverse as the vagina act as a

reservoir that prolong exposure to infectious secretion

## 3. Religion:

- The Religious Background of individual helps to restrict many premarital and extramarital relations → ↓↓ STDs.

## 4. Education:

- General rules: Low level of education is important factor in spread STDs  
Quota → lack of awareness of the preventive measures and the value of early diagnosis + tt.

### • Specific Observations:

- High level of education → important factor
- It may open the way for emphasis on sex in the books, magazines, mass media
- education → give sense of security in sexual practices.

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## 5 Contraception:

### male C.ps

- Condoms → ↓↓ Risk of acquired STDs.
- Puncture can be affected if not used properly.
- Destroyed During use or STDs outside penis as → pediculosis - pubis - Scabies - Chancre.

### Female C.ps

- Vaginal Contraceptives
  - Spermicidal Creams, Foams → ↓↓ Risk of STDs
  - They contain Surfactants (nonoxonyl 9)
    - The action: attach themselves to sperm → Reduce the surface tension of the sperm membrane → Break Down.

### • Oral Contraceptives

- Reduce Risk of development of PID, compared to use of IUD → that carry Risk High for development of PID

## b. Biological Factors:- (mucosal Defense Mechanism)

### 1- physical protection:-

- The mucus → secreted at the mucosal surface "prevent the adherence" of organism to them
- The antibodies → at the mucosal surface "prevent the adherence" of organism and help their phagocytosis" By the phagocytes (opsonization)
- The Cilia → at the mucosal surface "Sweep away" the organism from them

### 2- Chemical protection:-

#### - Lactoferrin:-

Iron Binding protein + Competes with the organism for this essential elements



4] → preventing their growth and dissemination.

- ↑↑ incidence of Disseminated gonococcal infection During menstruation Due to The availability of This iron from the Blood in the genital Tract → So the organism Can use it for → growth and Dissemination

- Lysozymes:-

enzymes → inhibit adherence of The organisms + Cause their "lysis"

- Zinc:-

"prostatic antibacterial factor" → inhibit the growth of

- Chlamydia
- Candida
- Herpes
- ← Trichomonas

3. Phagocytes protection:

1- Attraction: phagocytes are attracted to the organism By "Chemotaxis" with Some Chemoattractants produced from them.

## 2- Attachment :-

The phagocytes are → attached to the organism By the presence of- "specific receptors" on the Surface of the phagocytes.

## 3- Destruction:-

The phagocytes Destroy the organism through "Digestion" "Bactericidal enzyme" or "metabolic Disturbance" of the Organism By → production of Toxic Oxygen-Reduction Products as • hydrogen peroxide That Destroy the metabolism of the organism.

## B. Environmental Factors:

### a. Developing vs Developed Countries :-

7] There is many Differences Between



"Developing and Developed populations  
That lead to more spread of STDs

- Developing Countries have more prevalence in
- Developing Countries have Less prevalence of the following:

1. STDs in general

2. STDs with genital

ulcers → chancroid

↳ granuloma inguinale

↳ lymphogranuloma venereum

3. STDs with complications

↳ ophthalmia neonatorum

↳ PID.

1- available Data in  
Frequency, Complications,  
Contact Tracing

2- Diagnostic facilities  
and Laboratories with  
good equipments and  
quality control

3- Effective Drugs ~~at~~  
D.t High Costs and poor  
ptns Compliance.

## b-poverty:

• General rules:

- Responsible for High Rate of spread of STDs
- explained By • High Rate of migration of [8]

Young workers to The Big Industrial  
Cities.

- Housing problems
- Loneliness
- postponed marriage.

- all these causes → more search for Casual  
Sexual relations with prostitutes.

• Specific Considerations :-

- The changes in the economic states  
and earning Large incomes in the  
oil-Rich countries → Facilitate Travelling  
Casual sexual contact, Spread of STDs

## C.Occupations :-

- Barmaids
- taxi-drivers
- Soldiers
- Sailors
- Hotel staffs
- Tourists

\* occupations  
more  
susitable  
to STDs

\* more than half of prostitutes in some  
Tropical areas are infected with → gonorrhea  
→ Syphilis → HIV



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# C. Agent Factors:

## a. pathogenicity:

- Depend on specific "Virulence factors" such as  $\rightarrow$  pili in gonococci  $\rightarrow$  help there adherence to the host mucosal cells.

## b. Infectivity potential :-

- The period which During The organism Capable for infection Varies from - few weeks to several months as in case of gonococci
- The possibility of a man to get infection from vaginal intercourse from gonococci infected women  $\rightarrow$  Reach up to **40%**.
- possibility of women to get the infection from infected man Reach **90%**.

# C. Antibiotic Resistance

- High Rate of antibiotic Resistance of gonococci  $\rightarrow$  help more spread of STDs
- Example :- Resistance of "penicillin" Through production of penicillinase
- penicillinase producing *Neisseria gonorrhoea* (PPNG) strains  $\rightarrow$  have incidence of up to 50% in some area of Africa.
- The situation Become more Complicated by the emergence of Spectinomycin resistant strains  $\rightarrow$  ideal alternative to Penicillin
- Quinolones Resistant strains in England USA,

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# D. Prevention-Control ::

## a. prevention :-



1<sup>ry</sup>

- health education for the individuals Before sexual activity → to Reduce Risk of acquiring of STDs.

- Best places are → Home  
→ School  
→ mass media

- Best Carried By Rule of ABC

A - Abstain or Avoid any sexual activity → The only guaranteed protection against STDs

B - Be mutually faithful and have your sexual Relations with only one partner. also partner must be faithful.



2<sup>ry</sup>

- health education for individual After sexual activity on How to Reduce The Risk of spread STDs.

- Advised to Avoid any new sexual activity till The completion of The Diagnosis and ~~the~~.

C - Consistently → use condoms every time and in the correct way

## b. Control :-

① proper diagnostic and Therapeutic Services :-

- essential part → is The prescence of good facilities for The Diagnosis and the - of STDs including :-

- specialized STDs clinics
- well prepared laboratories

- More important → is The prescence of Laboratory screening for (AIDs) for High Risk population and Donated Blood and heat treatment of Blood products

② Partner tracing :-

- it's an essential step in control of STDs  
It's prescence of Asymptomatic partners that may lead to → more spread of STDs

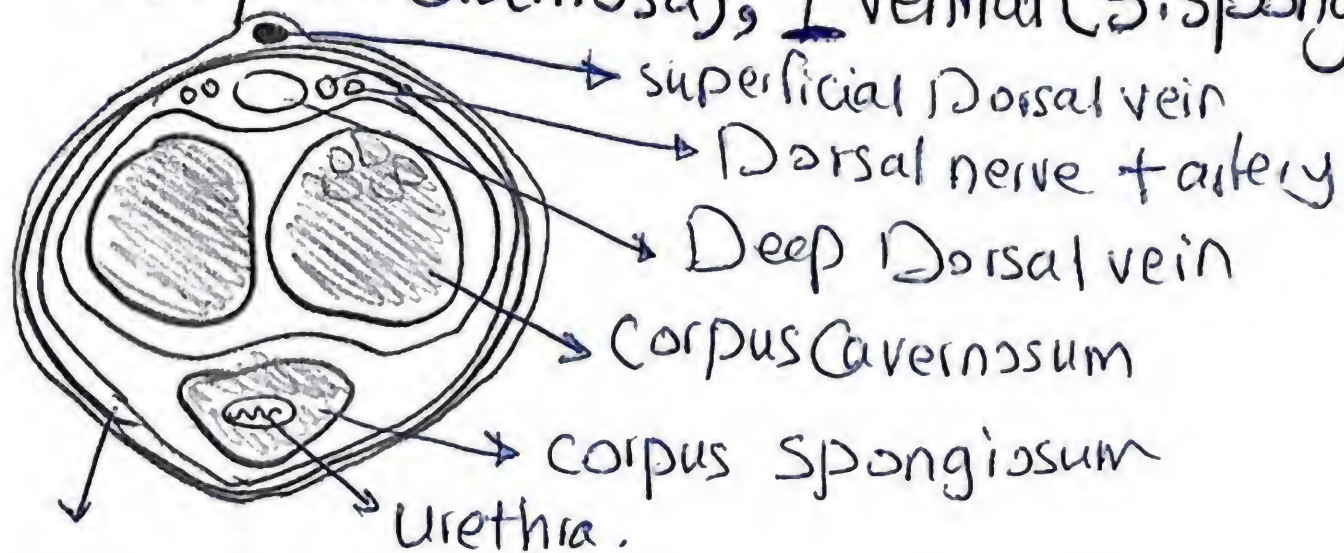


# Anatomical Aspects of STDs

## A. The male genital Organs:

### a. External genitalia :-

- The penis or phallus → The male external genital organ is formed of 2 dorsal (Corpora Cavernosa), 1 ventral (S. spongiosum)



Deep (Buck's) Fascia

- It's a potential canal that opens only during micturition. S shaped course
- These 2 factors render its drainage difficult

and predispose to chronicity and extension of urethritis

- ① The male Urethra is formed of 4 divisions related to 3 glands, controlled by 2 sphincters - as follows:

### ① Divisions:

Posterior Urethra — prostatic membranous

#### ① Prostatic Urethra :-

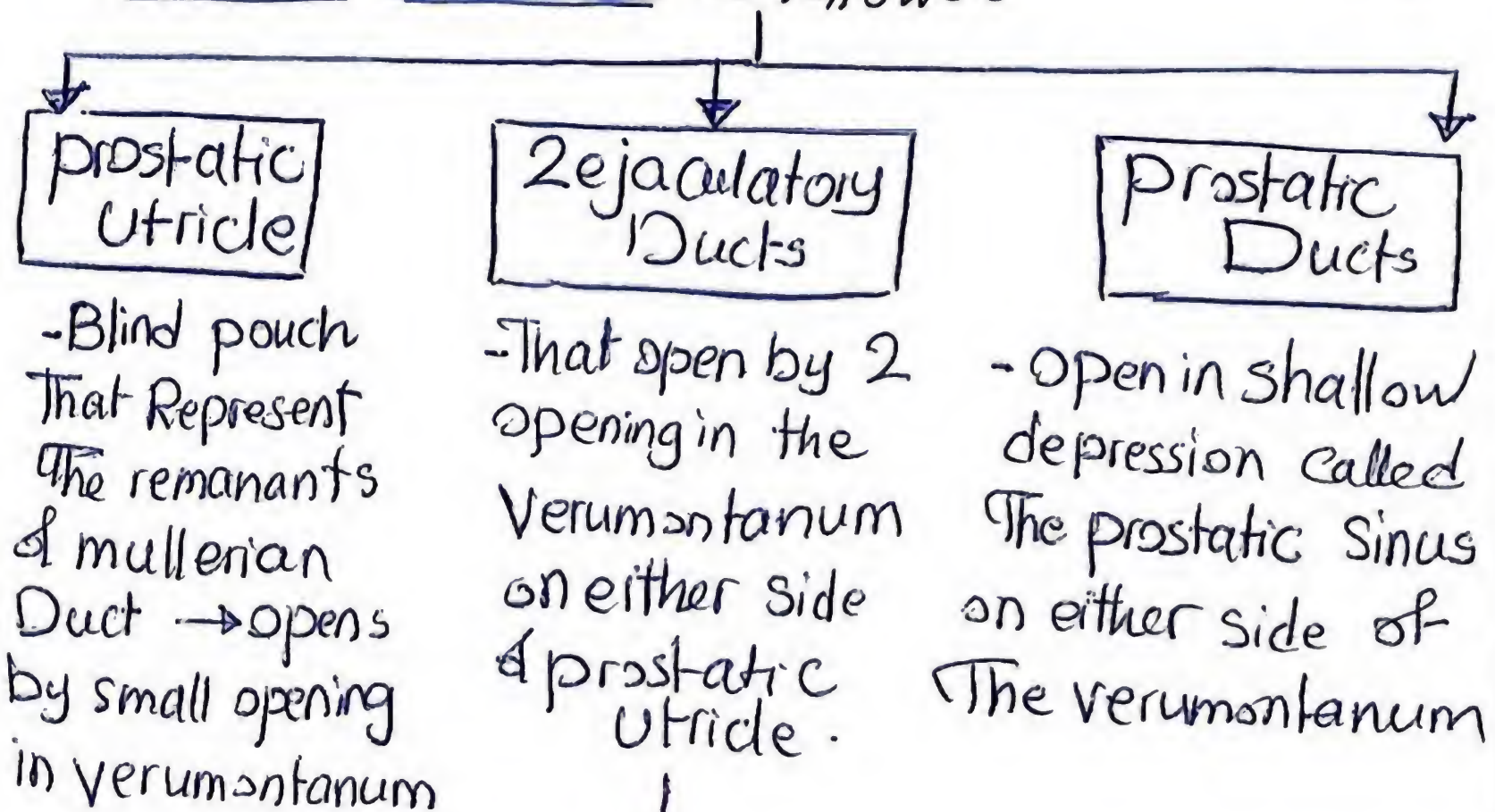
- 3cm part of post. Urethra.
- It's the widest and the most distensible part of the urethra.
- It extends from :- The neck of the bladder passing through the substance of the prostate to end at the neck of the prostate



by becoming the → membranus Urethra

- The prostatic Urethra → Lined By : transitional epithelium

- The prostatic wall shows → elevation "Verumontanum"  
OR "Colliculus Seminalis" → Its Related to 3  
important structures as follows :



★ Clinical point:

Failure of the Prostatic Utricle. to Regress During the embryological developments → encroach on the surrounding ejaculatory Ducts → obstruction + infertility

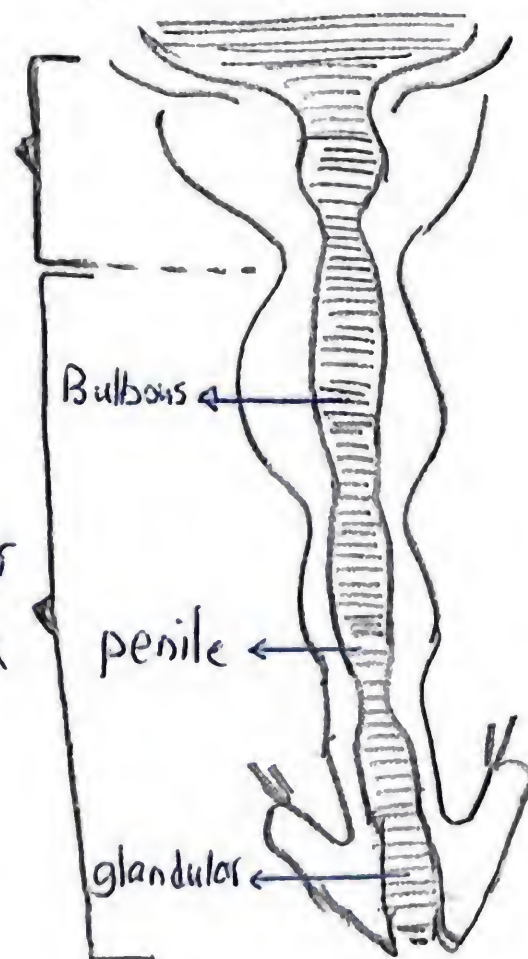


Transitional Cell epithelium ← posterior Urethra

pseudostratified or stratified columnar epithelium ←

Anterior Urethra

stratified squamous epithelium





### ③

## ② Membranous Urethra:-

- Thickest part of the urethra → as it passes through the urogenital diaphragm
- It's a muscular organ with both smooth and skeletal muscles -
  - Form the external (voluntary) sphincter
- wrongly believed that → it's very short but actually it's about 2.5 cm long
- lined by: Columnar epithelium

## Anterior Urethra

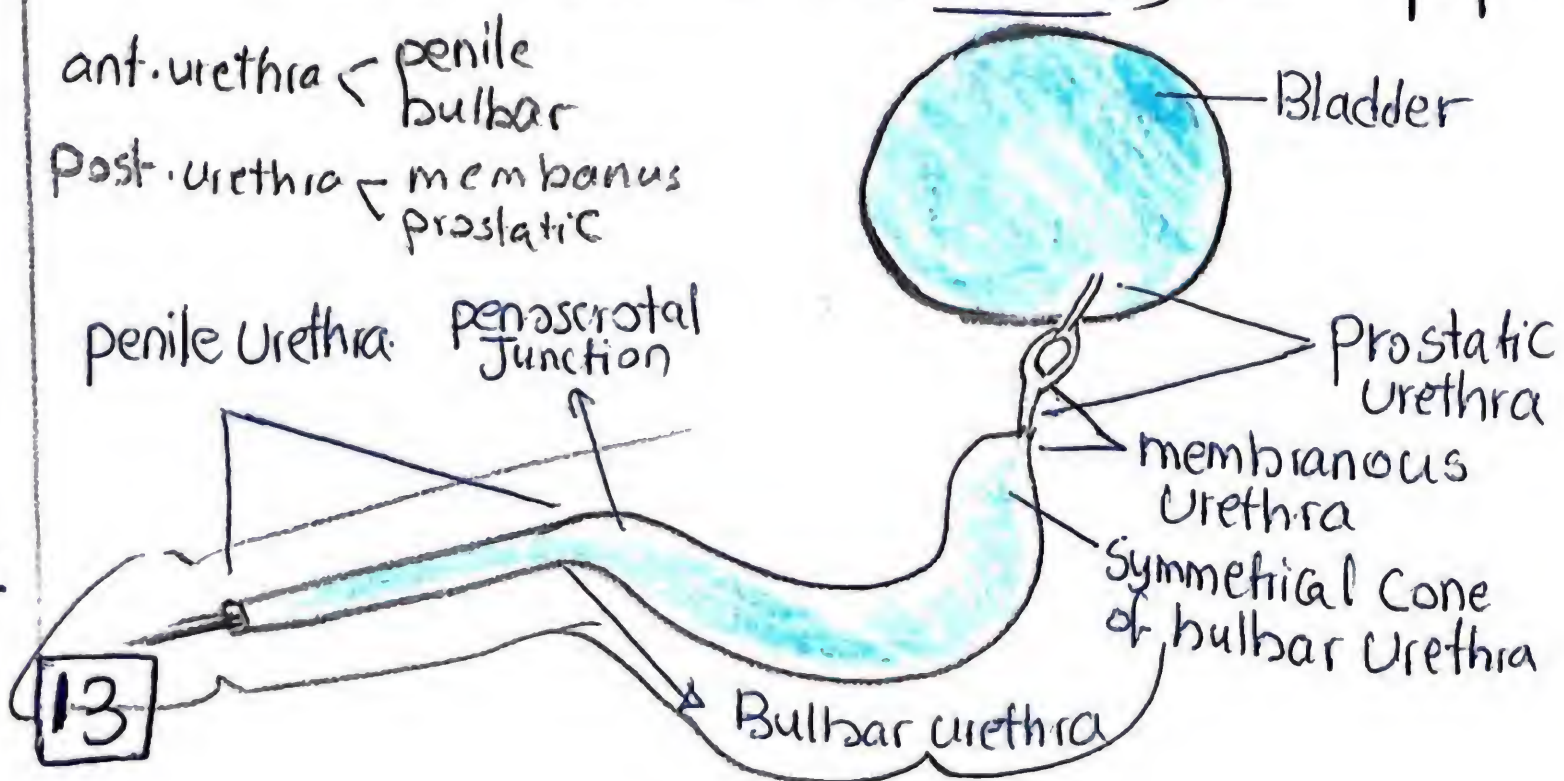
- 15 cm Long extend from The end of the membranous urethra → till The external meatus
- as the tip of glans penis.
- formed of 2 parts:-

→ ① Bulbous Urethra :- proximal part of anterior Urethra - Surrounded By →

The bulb of the penis and bulbospongiosus muscle.

## → ② penile or pendulous Urethra:-

- The distal free part of the anterior urethra
- starts → as a continuation of the proximal bulbar urethra. at the lowest level of symphysis pubis
- it ends by passing through the glans penis where it forms "small Dilatation" named the fossa navicularis" to end finally at the "external meatus" → The narrowest point of the entire canal.
- The Fossa navicularis is lined by: st. sq. epith





# ① ★ The glands related to male Urethra:-

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- 3 glands in close related to The male Urethra

## Cowper's glands

- pair of glands on either side of the "membranous" Urethra
- ↳ whose Ducts open into the bulbar urethra.
- These secrete drops of mucoid secretion "the pre-semen"
- ↳ During the excitation stage of sexual Response cycle.

## Littre's glands

- multiple mucous glands on the submucosa of the Penile Urethra and open by multiple Ducts into the roof and sides of the penile Urethra
- These opening are found in depressions or mucosal folds called "Lacuna of Morgagni" → The largest of which is just proximal to the fossa navicularis called "Lacuna Magna"

## Tyson glands

- They are just present proximal to the "Coronal sulcus" and their Ducts open on either side of the "Frenulum" → That is a small median fold on the under surface of the glans penis.
- They secrete "Sebacous secretion" "Smegma"
- ↳ helps to retraction of the pepuce over the glans penis in non-circumcised male.

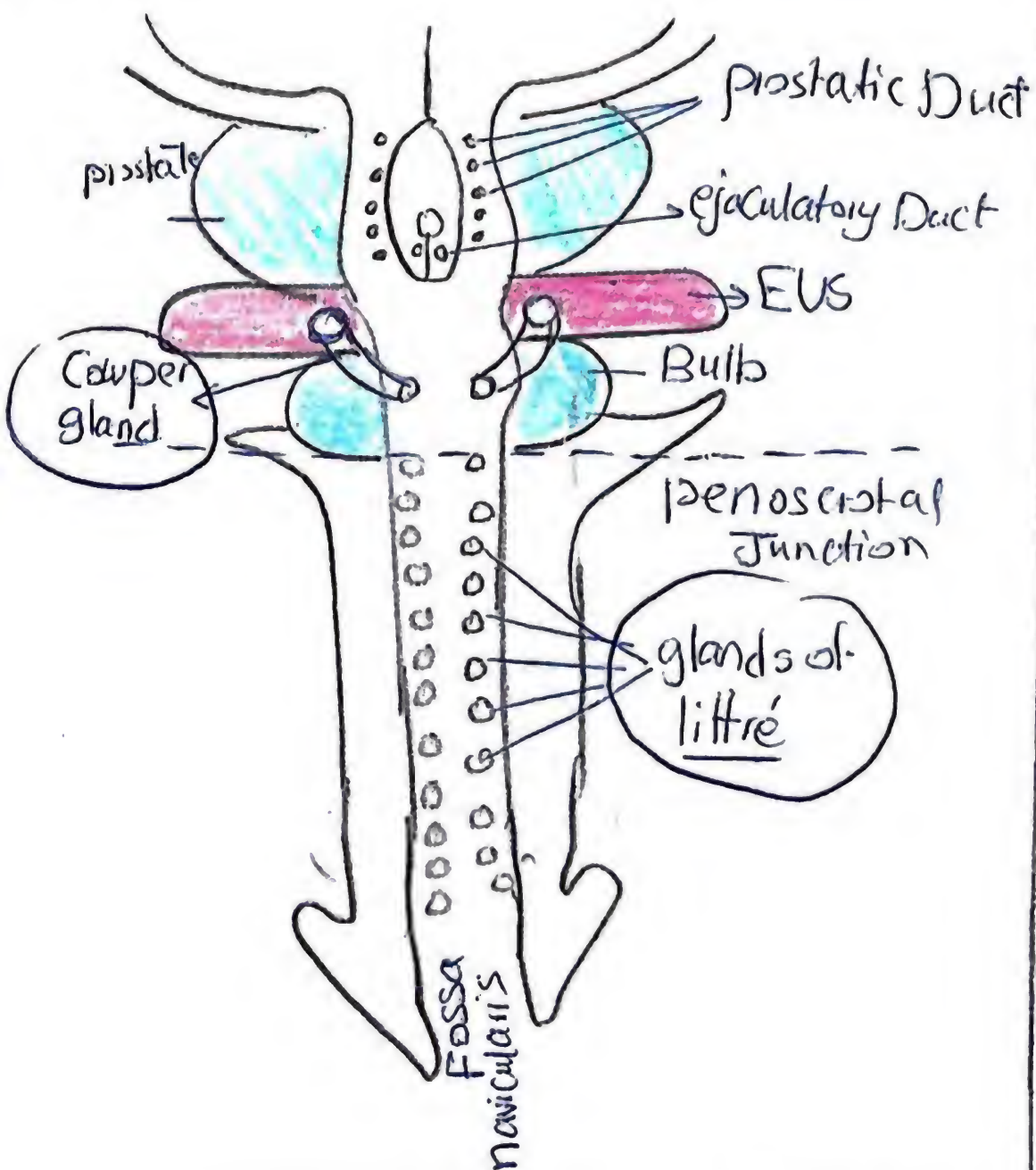
## ★ Clinical points

- if Catheter → introduced into Urethra → it should be introduced with its tip Downwards.
- ↳ Presence of Lacuna magna on the Roof of the Urethra → That may catch the tip of Catheter

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4 5



## ★ The Sphincters Related to Urethra :-

### Internal sphincter

- It controls The Bladder neck and prostatic Urethra above The opening of ejaculatory Ducts.
- formed of involuntary non-striated muscles
- supplied By autonomic nerve supply.

### External sphincter

- Controls the membranous Urethra
- Its formed of: Voluntary st. muscles
- supplied by: Somatic nerve supply (perineal branch of pudendal nerve)

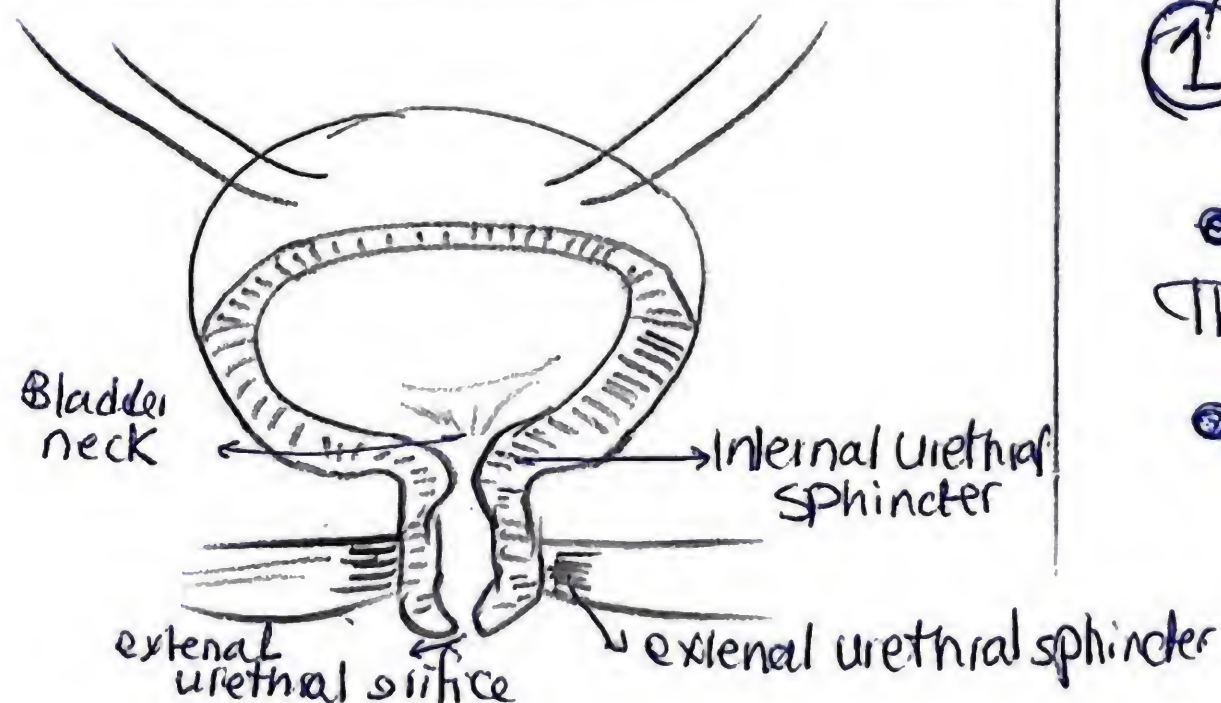
## b. Internal genital Organs

- Testis - Epididymis - vas deferens - Seminal vesicles
- Prostate

### ① The Epididymis

● Grossly The epididymis → Coma-shaped structure That overlies The Superior-posterior surface of testis

- Formed of: Head (upper part)  
Body (intermediate)  
tail (lower part)

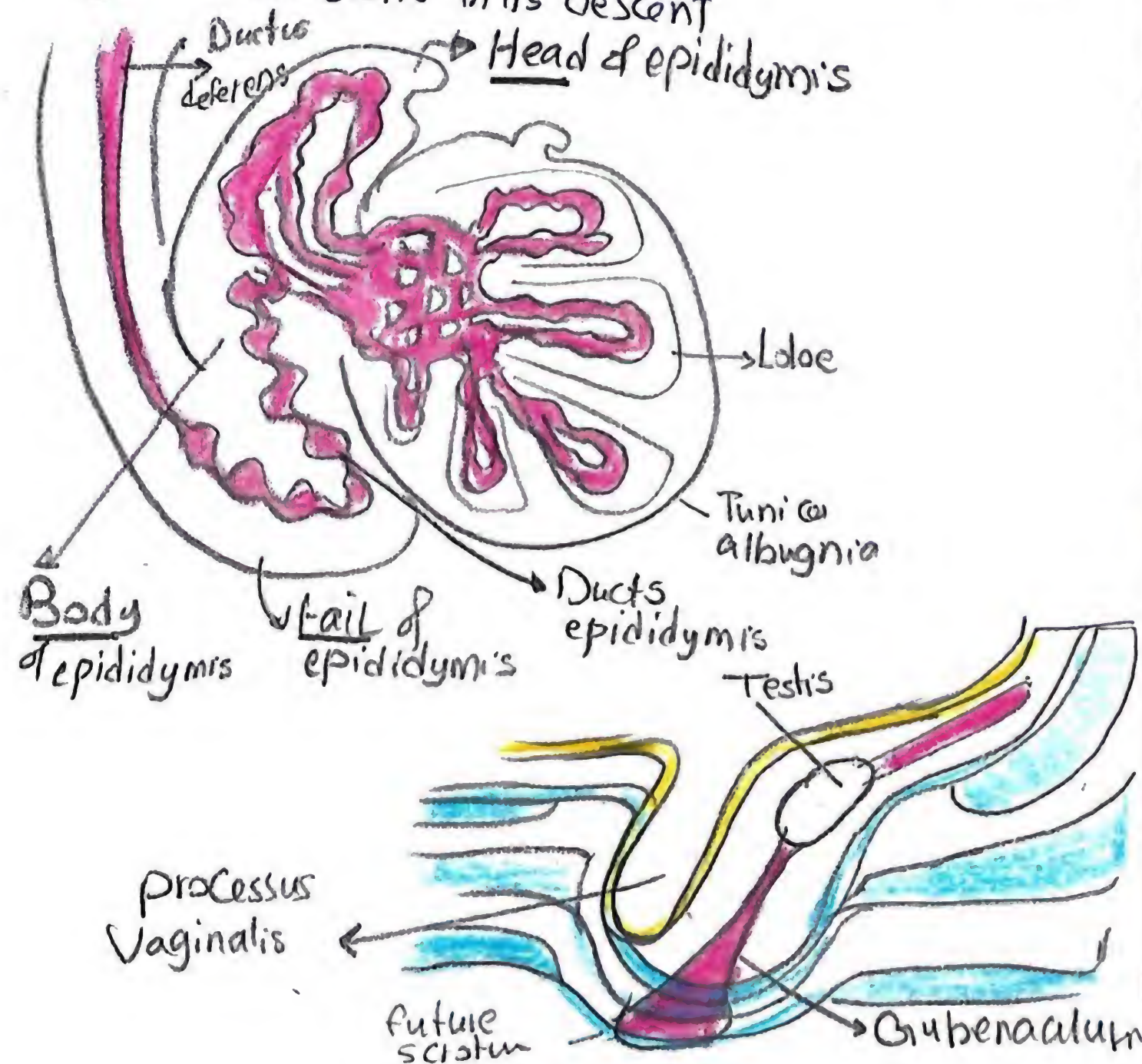


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- 13
- 6 The tail → attached firmly to the Lower pole of the testis → By fibrous remanant of the gubernaculum "epididymal ligament"

→ is a fibrous cord → extend from the foetal testis to the scrotal swelling.  
 - It occupies the potential inguinal canal and guides the testis in its descent



## Microscopically

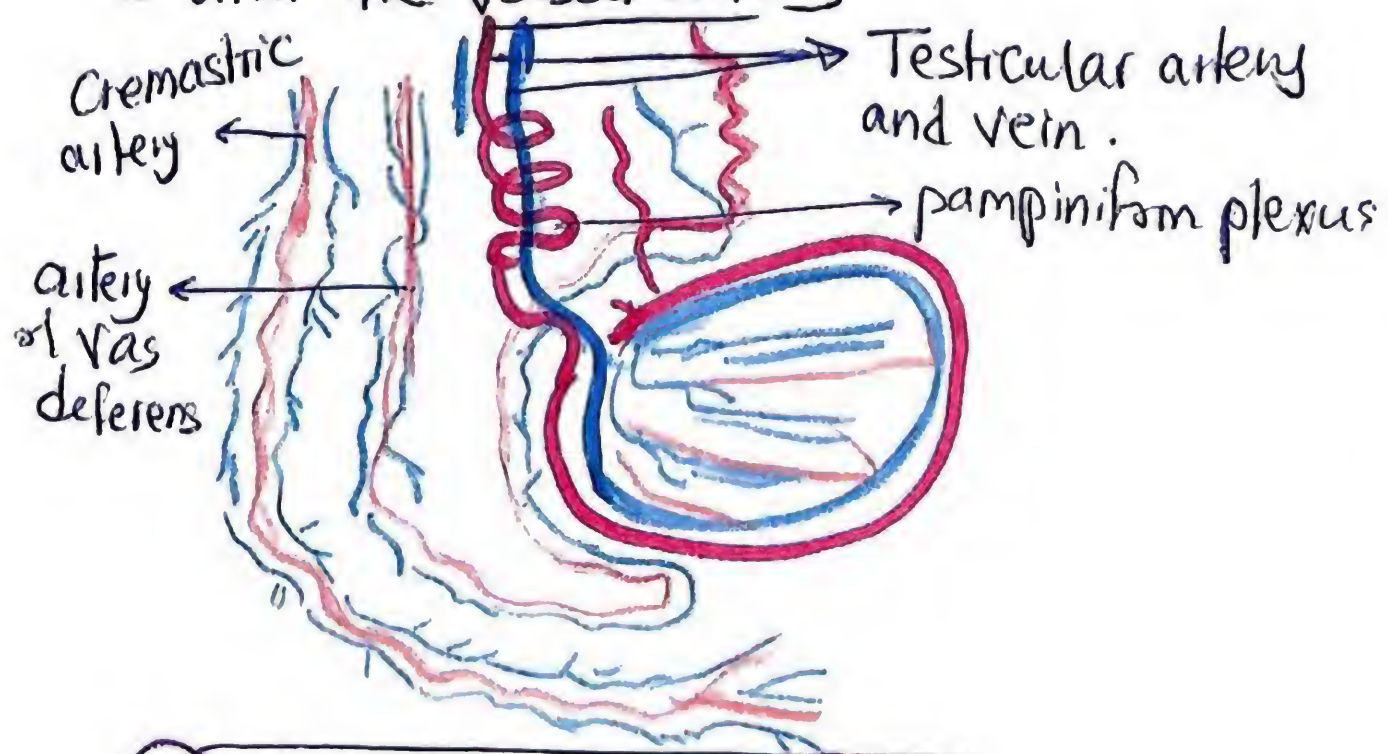
- The epididymis formed of :-
- "Seminiferous Tubules" → well form network in the mediastinum testis "Rete testis"
- From Rete testis → arise (12-20) efferent ductules (vasa efferentia) → That pass from the testis to the testis to epididymis → to form the epididymal lobules in the epididymal Head
- Then they unite → to form the Convuluted duct of the epididymis (That is → 6 meters length. enclosed within a connective tissue sheath in the Body of the epididymis)
- Finally → This epididymal Duct → ends in the Tail of epididymis By joining The Vas deferens

Testis	Efferent Ductules	Epididymis	Vas deferens
Seminiferous Tubules ↳ Rete testis	(vas efferentia)	Head Body Tail Lobules → Ducts	



## The Arterial Supply

- Come from a branch from the testicular artery (Internal spermatic artery) → That is Branch from the ~~testis~~ aorta
- in addition to collateral from the Cremasteric (External spermatic artery)
- and the vasal artery



## \* Clinical important points

- 1- The cremasteric - vasal arteries → Can compensate for the accidental injury of the testicular artery as may occur during varicocele → and supply the testis and epididymis with adequate blood

2- 'in the History of varicocele → great caution + extreme care → to avoid injury of the vasal artery During vas dissection in the operation of epididymovasostomy OR vasovasostomy at the side of previous varicocele

## Venous Drainage

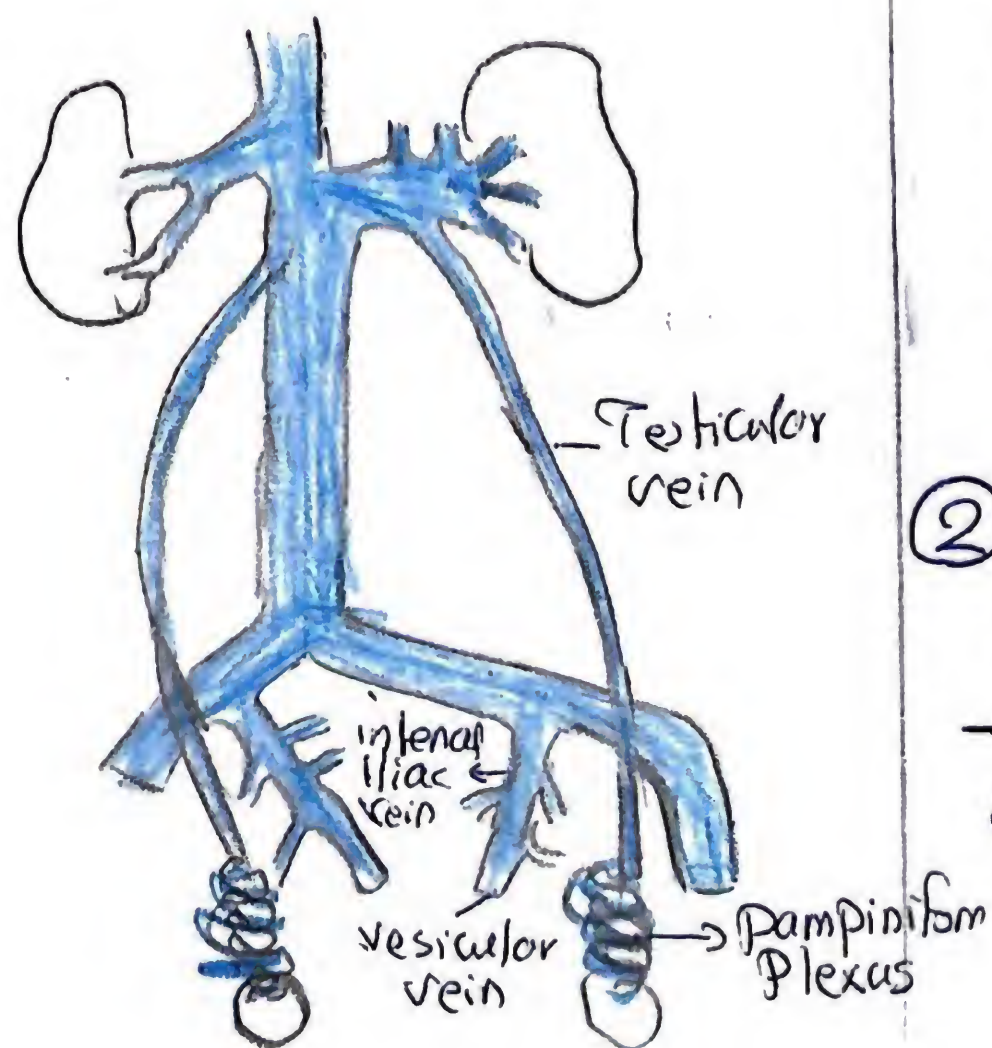
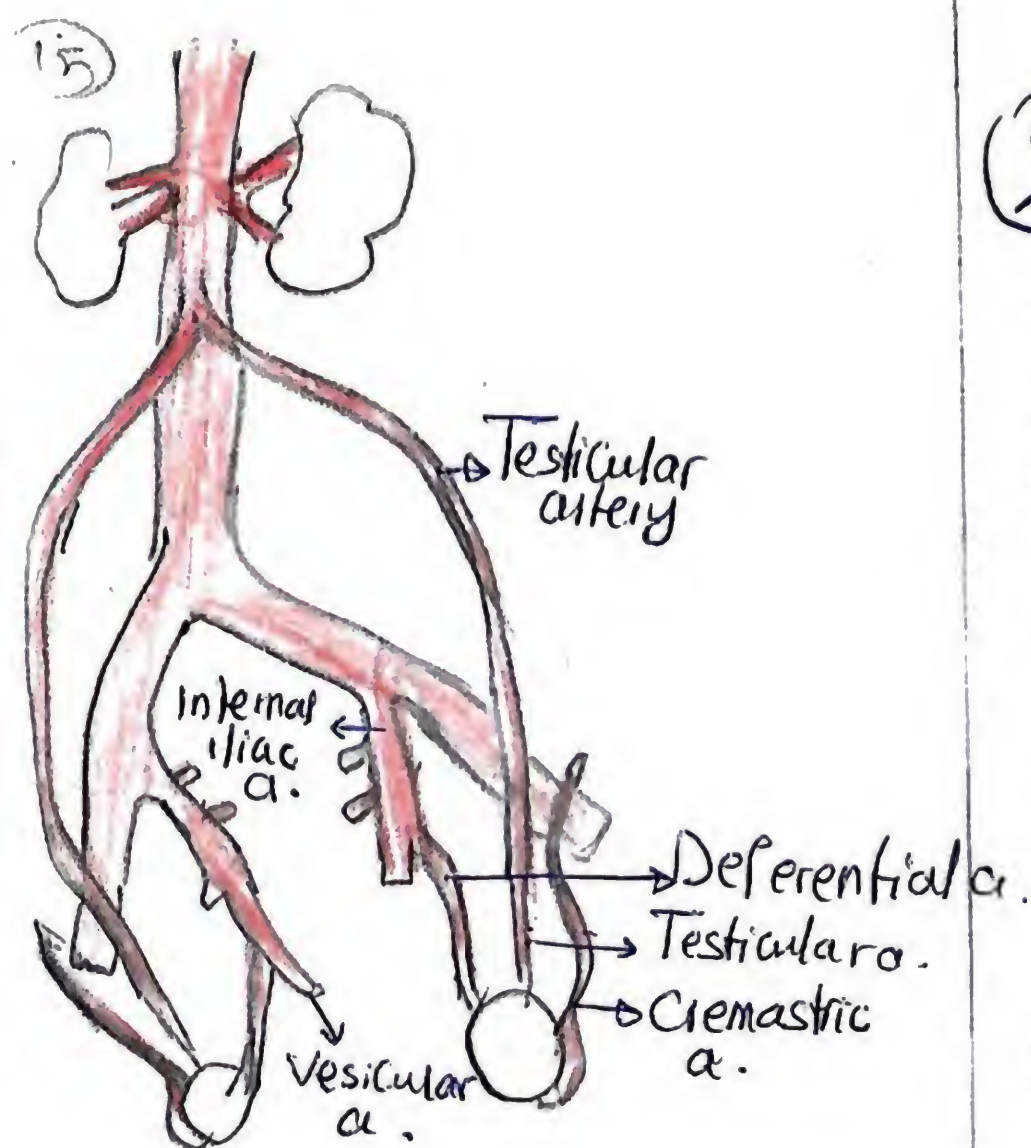
- The vena marginalis of epididymis → may join the cremasteric veins and the pampiniform plexus of veins →
- That form a network of about 15 veins around the testicular artery
- These veins fuse in inguinal canal → form testicular internal spermatic vein that drains into the left renal vein (on left side)
- Inferior vena cava (on right side)

## \* Clinical point

- Varicocele → varicosity of the testicular + cremasteric veins

Dilation  
 elongation  
 tortuosity  
 thickening





## ② The Vas Deferens

- Its muscular Tube of about 45 cm long, 2.5 mm diameter
- It begins → as Continuation of the Lower end of the epididymal Duct at the level of the epididymal tail
- and ends → By uniting with the Duct of seminal vesicle to form the ejaculatory Duct → That opens on verumontanum on the prostatic Urethra
- its Divided into 5 portions:-

### ① Epididymal portion:-

- Starts → at The epididymal tail and Runs a tortuous Course within The tunica vaginalis along post. aspect of The testis
- Clinical point: This part of Vas is the part more exposed to Post-inflammatory obstruction at its Junction with the

- ### ② The scrotal portion:-
- has Straight Course within the Spermatic Cord
  - Clinical point: This part of Vas is The part involved in the Scrotal operations as Vasectomy, epididymovasotomy.



③ The inguinal portion :- enters The inguinal Canal Through The external inguinal Ring and leaves it through the internal inguinal Ring accompanied By The artery of The Vas deferens

- Clinical point :-

This part of Vas more exposed to accidental injury During The operation of the inguinal herniotomy with resultant post-Traumatic obstruction.

- This is more common if Herniotomy was Done During childhood D.t The delicate structure of the vas.

④ The pelvic portion :- Run in the pelvis in The retroperitoneal space related to The Ureter and Urinary Bladder Then along The medial aspect of The Seminal Vesicle

⑤ The ampulla :- of the Vas is the dilated portion of The Vas

- Then the vas narrows again, unites The Duct of the seminal vesicle to form the ejaculatory Duct that opens in the prostatic urethra

★ The arterial supply :- To the vas comes from the vasal artery That Comes from

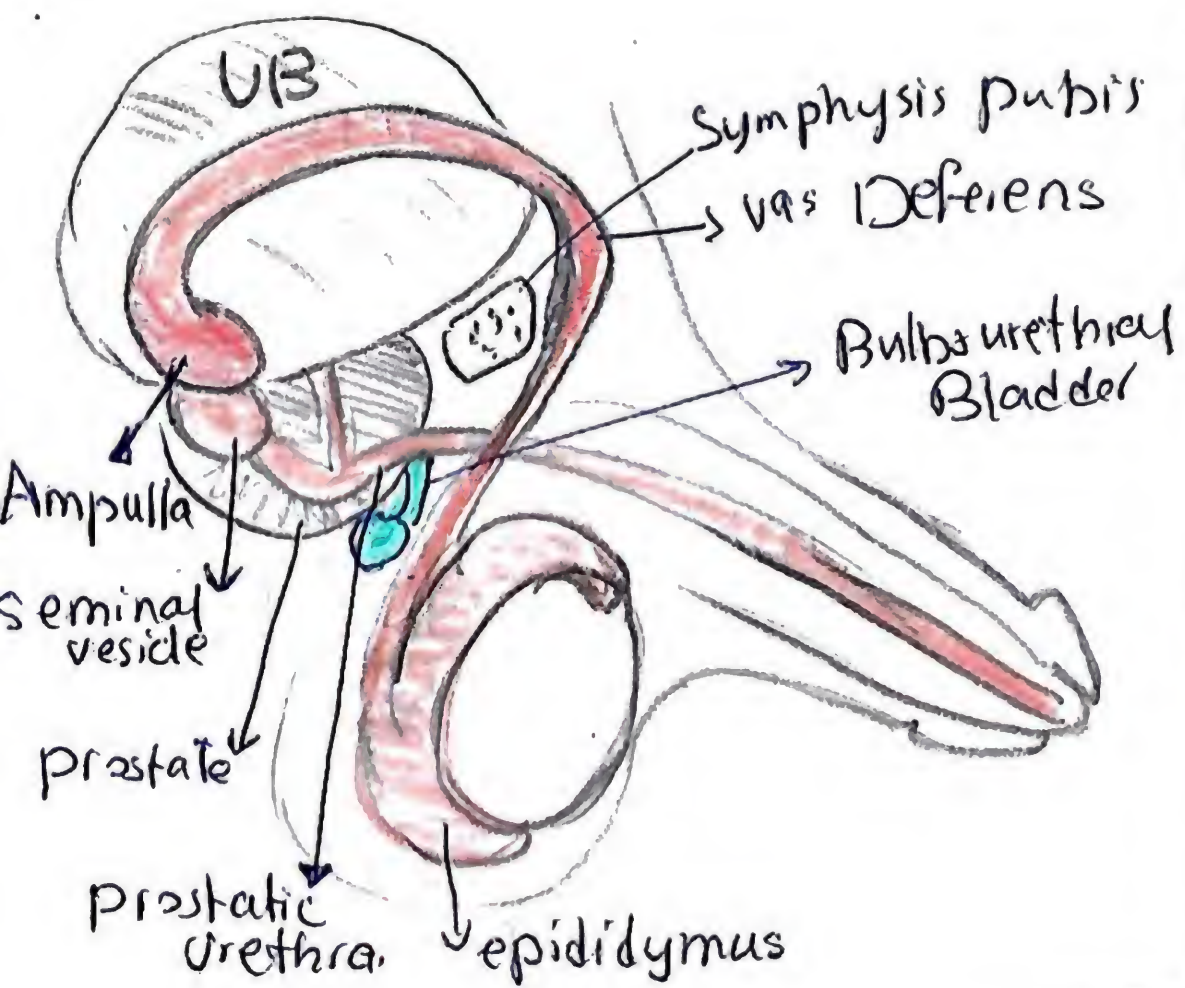
The inferior visceral artery That is a Branch from the internal iliac artery

- The vasal artery → gives a dense network of the Capillaries to the Vas

★ The venous Drainage - lymphatic Drainage

= That of epididymis





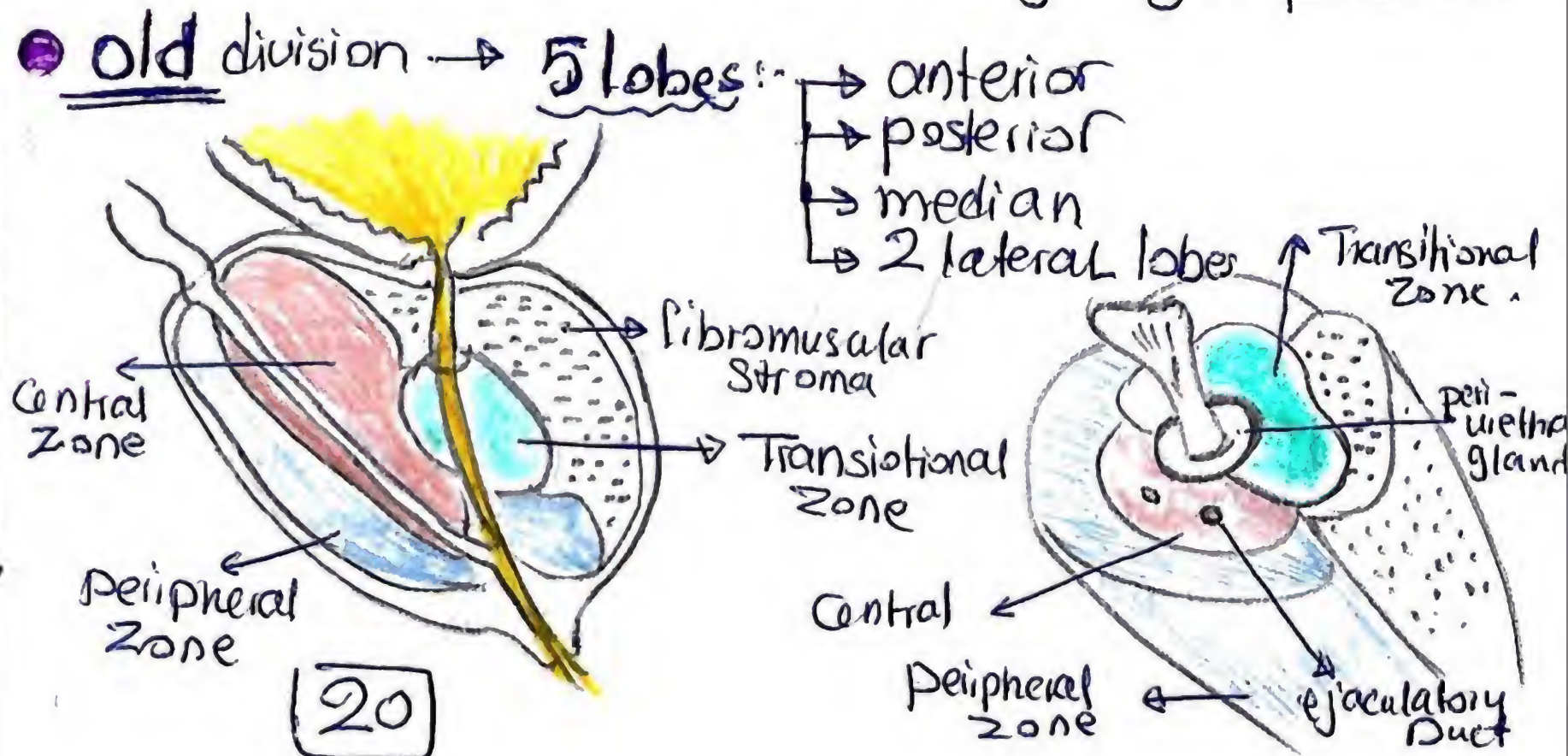
### 3 The prostate

- Shape: inverted cone with posterior and 2 inferolateral surfaces That measures about 3.5cm Transversely at its Base, 2.5cm in its vertical
- It surrounds The prostatic part of the Urethra
- Related to anteriorly → Symphysis Pubis, posteriorly → Rectum

- (17)
- formed of: glandular element 70%  
fibromuscular element 30%
  - The acini, Ducts of the glands → lined By Columnar epithelium
  - The prostatic Duct (63) → open in prostatic Urethra

- Recent Division → into 3 Zones:
  - glandular Tissue
    - Central Zone 95%
    - peripheral Zone 5%
    - Transitional Zone 5%
- ⊕ Clinical important of This Division:

- The translational zone is the site of benign prostatic Hyperplasia But never the site of malignancy
- The peripheral zone is the site of malignancy in prostate





⑧ Genital sphincter:-

- muscular Condensation of the area of the prostate around the urethra that may consider as genital sphincter with No counterpart in the female.
- Its function may be occlusion of the urethra to help to prevent Retrograde ejaculation.

\* The arterial supply:

- from the inferior vesical artery
- middle rectal artery.

## ★ Venous Drainage:

- Drain into the inferior vesical veins OR
- vertebral venous plexus

⑧-clinical point:

- Carcinoma of prostate gives early metastases to the vertebral column through Blood spread

## ④ Seminal Vesicles

- Paired organs formed of Highly convoluted glandular sac about 5cm Long 1cm wide
- They are lateral to the vas deferens and their Ducts → join the vas deferens to 21

Form The ejaculatory Ducts. (18)

⑨ arterial supply - Venous Drainage  
= prostate

\* Clinical examination: per rectal examination

- → During PR examination →  
The prostate only is felt

→ You can Peel the size  $\leftarrow \begin{matrix} \uparrow \\ \downarrow \end{matrix}$  of the surface

The shape  $\begin{cases} \text{Regular} \\ \text{Irregular} \end{cases}$

Smooth      Singular

The median sulcus { Preserved  
Occluded.

- The tenderness, fixation, consistency

- → The seminal vesicle not felt except only when they are enlarged not Obstruction, inflammation & Tumor

② → PR Contraindicated :-

- ↳ urethritis
- ↳ prostatic abscess

So urine analysis → mandatory before PR



# B. The Female genital organs:

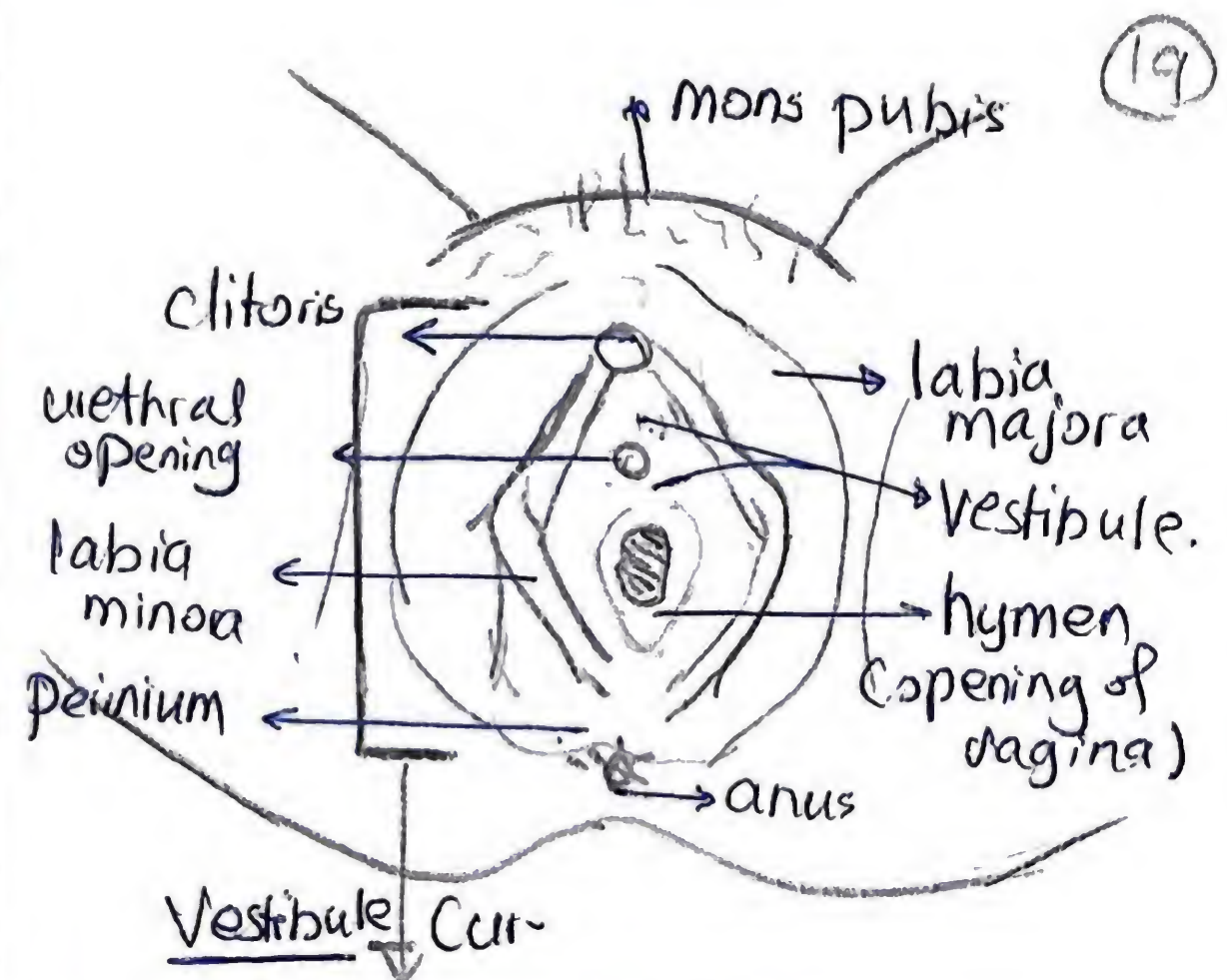
## a. External Genital Organs: (vulva)

### 1- Mons pubis

- Soft fibrofatty elevation over the pubic bones.
- The overlying skin is hairy
- Its upper edge → horizontal & ends abruptly where the mons meet the anterior abd. wall.

#### \* Clinical points:

- The pubic hair of male → Triangular shape with the apex towards the umbilicus
- This is under androgenic stimulation
- In case of Hypogonadism with androgen deficiency the upper edge become horizontal in male
- The upper edge extend to the umbilicus in the females with abnormal ↑ in androgen secretion
- This excess hair "Hirsutism"



### 2- Labia Majora

- pair of Rounded folds → extend posteriorly from mons pubis to surround the vestibule → finally fuse posteriorly at the perineum → forming the Fourchette.
- The overlying skin → covered with hairs, sweat glands & sebaceous gland.



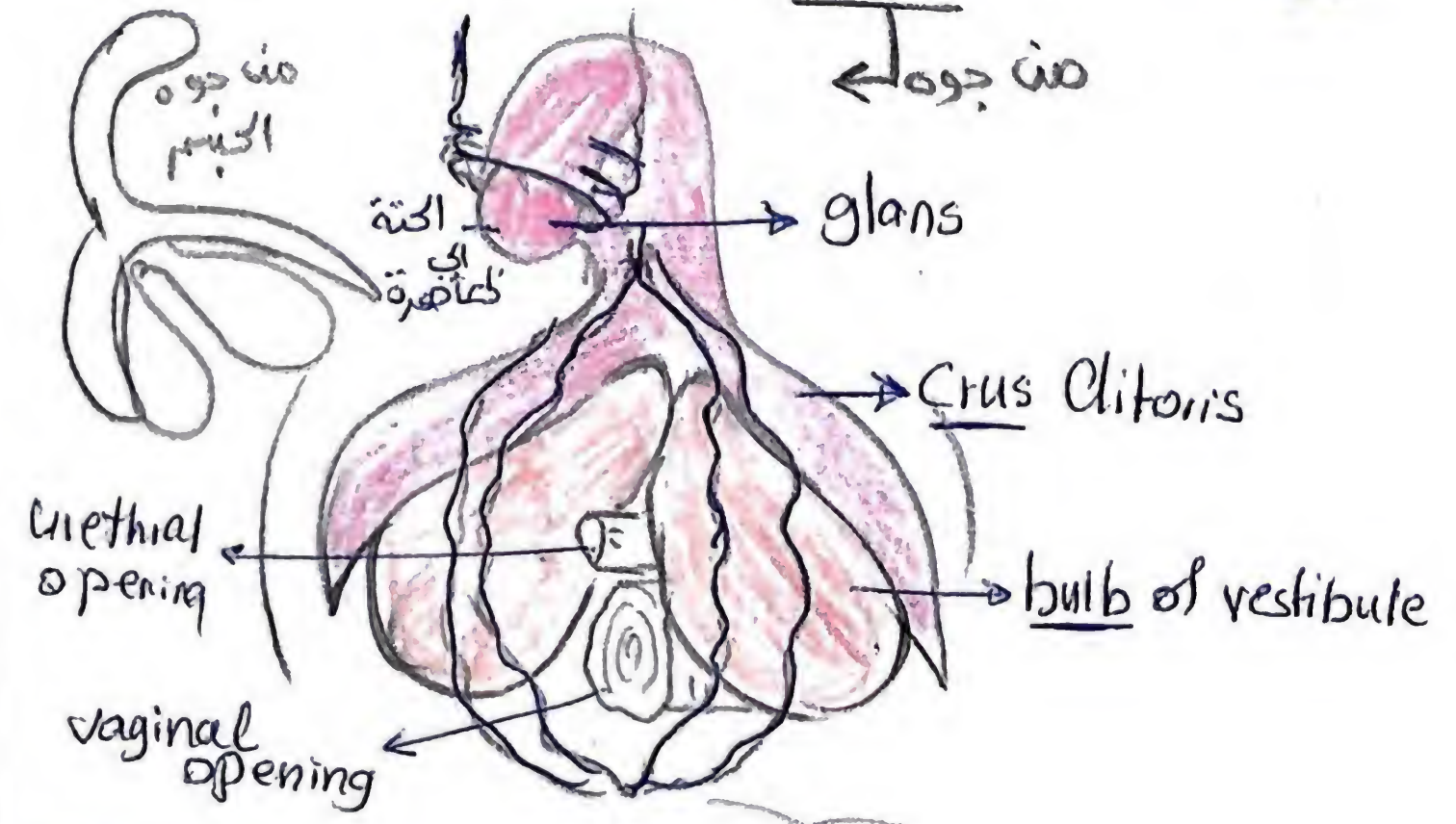
### 3- Labia Minora

- pair of thin folds of the skin which lie between the labia majora.
- They extend anteriorly → to form skin fold around the clitoris
  - upper prepuce of clitoris
  - Lower frenulum
- They contain
  - Sebaceous gland
  - Sweat glands
- No Hair
- they are very sensitive, contain → erectile tissue

### 4- the Clitoris

- extremely sensitive organ that correspond to the penis in the male But Not Traversed by the Urethra.
- The Body and 2 crura → formed of erectile tissue, attached posteriorly to the descending pubic Rami

- Surrounded By: Ischio Cavernosus muscles that help → erection of clitoris



### \* Clinical points

- The clitoris - labia minora → were excised in a criminal process named wrongly "Circumcision" correct name "Female genitalia mutilation" الختان
- it has No → Religious, medical, logical Basis → Should be Condemned



# 5 - The Vestibule

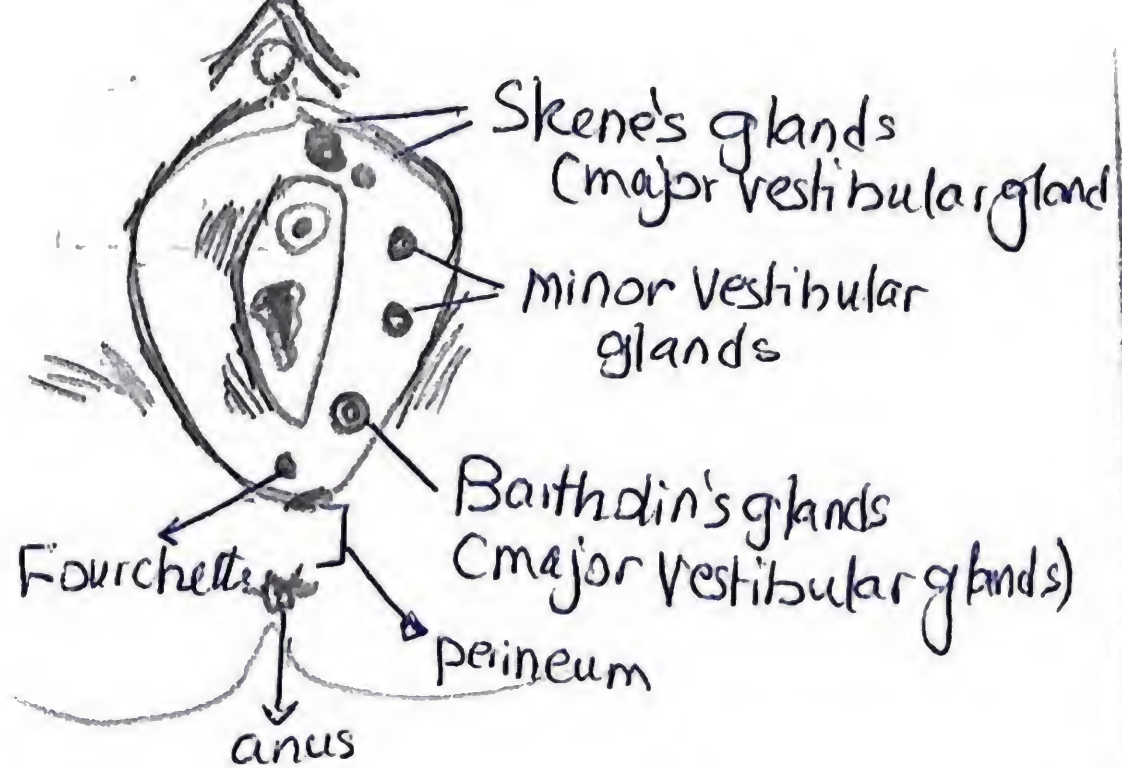
- Triangular area in the midline that Bounded anterolaterally → By labia minora & posteriorly → By Fourchette
- At the apex of the triangle → The clitoris
- Into the vestibule → Open the Urethra 2 cm posterior to the clitoris
- The female Urethra is about 3.5 cm long
- The Vestibule contain The :-
  - ↳ vaginal orifice posterior to Urethral orifice
- This orifice (vaginal) → Closed in Virgins By hymen
- This Hymen → Central Circular or Crescentic opening that vary in size from pin-hole to opening that admit 2 fingers
- Hymen → Partially Rupture after first Coitus → disrupted after the childbirth

- 21
- The remaining parts after rupture are known as "Carunculae myrtiformis" OR "Carunculae hymenalis"
  - The vestibule contains The openings of Bartholin glands OR Vestibular glands on each side at the junction Between The labia minora - and vaginal orifice.

## \* Glands Related to Vestibule

Urethral glands	Paraurethral glands Skene's	Vestibular Bartholin
<ul style="list-style-type: none"> <li>- many small glands along the Urethra.</li> <li>- They correspond to "Littre's" glands in male</li> </ul>	<ul style="list-style-type: none"> <li>- on either side on the Lower end of Urethra</li> <li>- Their Ducts into Lower end of the Urethra on either side of Urethral Orifice</li> <li>- Correspond to "prostate" in male</li> </ul>	<ul style="list-style-type: none"> <li>- line within the labia majora on either side</li> <li>- racemose glands and their Ducts open at each side at the Junction Btwn labia minora - Vaginal Orifice</li> <li>- Corresponds to Cowper's</li> </ul>





### ★ Clinical point

- They are normally → Not palpable unless enlarged By inflammation or Tumor

↳ Can felt by index finger inside the vagina

Thumb on Labia majora on either side.

## b. Internal genital organs

### 1. Vagina

muscular Tube of about 10 cm in length → from (22) The vulva to the uterus

- The anterior and posterior walls → are normally in opposition

- It's normally kept moist By the secretion of the Uterine and the Cervical glands → Watery Transudate Through its walls - But it contain No glands

- The vagina lined By: St. sq. epithelium → Become Thick & Contain glycogen under the effects of estrogenic Hormones after puberty.

### ★ Clinical point

- The vagina after puberty → is more Resistant to Pathogenic organisms. Due to: Thickness of its layers and glycogen Content that is transformed By the normal flora of Döderlein Bacillus into Lactic acid → That kept The pH acidic 4

- Before puberty - after menopause → with absence of estrogen, the vagina is thin and pH = alkaline → helps invasion of organisms



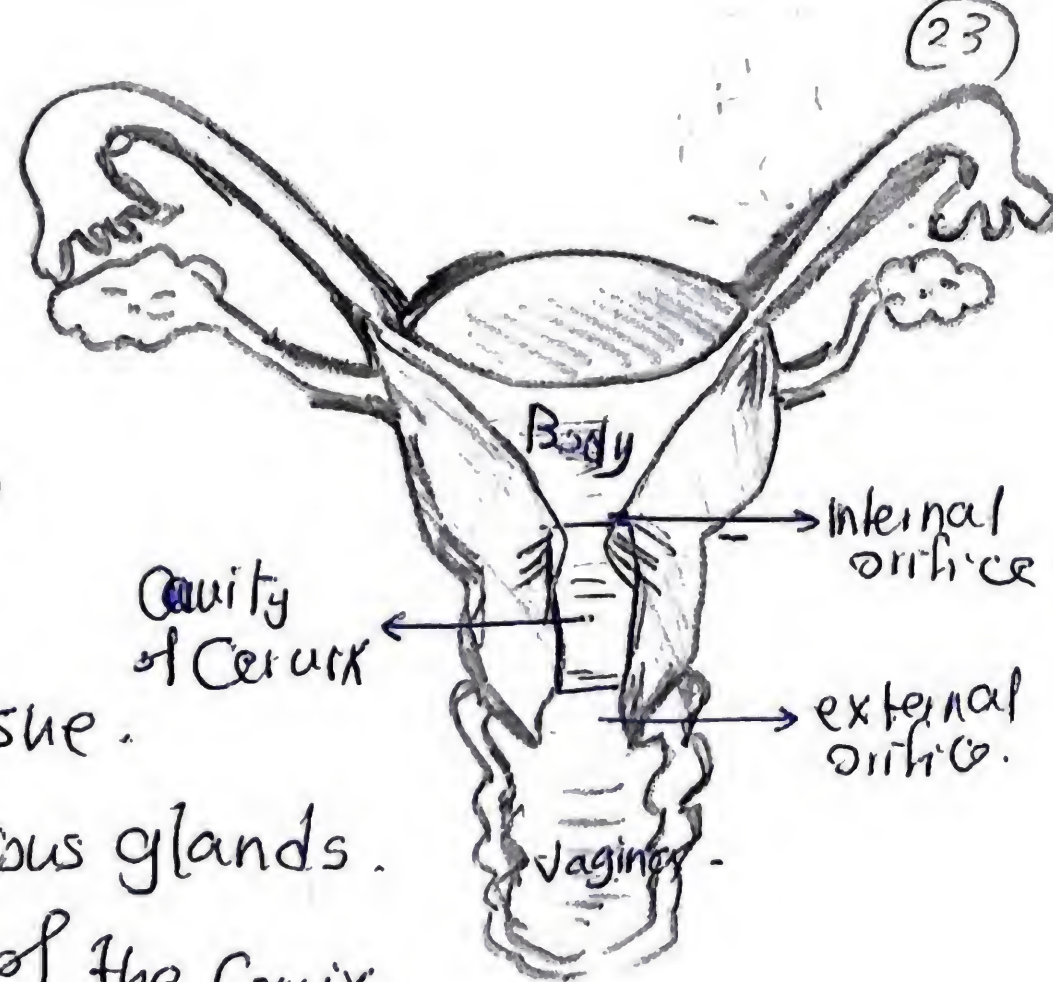
## 2- The Cervix of Uterus

- Spindle shape Canal 2.5 cm in length, continuous above with the Body of the Uterus, opens Below in the Vagina. - The wall is formed of fibromuscular Tissue. lined By → Columnar epithelium → That contain mucous glands.

- at the external Os : → small opening in the Lower part of the Cervix inside the Vagina - This Columnar epithelium → Transformed into Squamous epith

### \* Clinical Points

- ① - The mucous gland at the Cervix are "race mose" nature
  - They are Compound tubuloalveolar glands.
  - This complex and deep glands → + Columnar epithelium ⇒ predispose to invasion. and chronicity of infection By sexually Transmitted organism.
- ② - The Site of sq. Cell Carcinoma ⇒ of the Cervix → at the external Os → where the Columnar epithelium is Transformed into → Squamous epithelium





### 3. The Body of the Uterus

- ⊖ The Uterus → Thick muscular pear shape
  - Its body is 5 cm in Length.
  - The whole uterus including the Body (5 cm) and Cervix 2.5 = 7.5 cm length
- ⊖ The Cavity → of Body of Uterus is Triangular with the Bas → upwards, apex → Downwards at the Junction with the Cervix where it is narrowed to Form the "Internal os"
- ⊖ The Body part of uterus above the entrance of Fallopian Tubes "Fundus"
- ⊖ During the Reproductive period → The Uterus lined with columnar epithelium "Endometrium" that undergo cyclic changes every month "Menstrual cycle"
- ★ Clinical points - The activity - cyclic change of endometrium render it resistant to organisms

- Before puberty → and → after menopause <sup>(24)</sup>  
its thin with No monthly shedding →  
Liable for infection.

### 4. The Fallopian Tubes

- ⊖ extend on either sides of uterus
- ⊖ extending from the Uterine Cornu to the end near Ovary.
- ⊖ Each tube is 10 cm length and Conveys the Ova from the Ovary to Uterus
- ⊖ The opening of the Tube near ovary is in Direct continuation with peritoneal Cavity
- ⊖ The lumen of the Tubes lined with delicate ciliated epithelium that form a number of folds
- ⊖ There is No gland or submucosa.
- ⊖ No monthly Shedding During menses



## ★ Clinical Points

1. This delicate folded lining epithelium of the Tubes → in addition to absence of monthly Shedding → make them vulnerable to invasion by STDs organisms → Obstruction - infertility
2. The Direct Continuation of the Tubal opening on the Ovarian side with the Peritoneal Cavity → Carry the Risk of Peritonitis & Inflammation of Tubes (Salpingitis)

## 5- The Ovaries

- 2 almond shaped organs solid
- measuring about 3.5 cm
- 1 cm in thickness.
- They lie against the peritoneum of the lateral pelvic wall.
- It is the site of the production of the ova that are Transmitted to Fallopian Tubes

For Fertilization By sperms.



# Bacterial

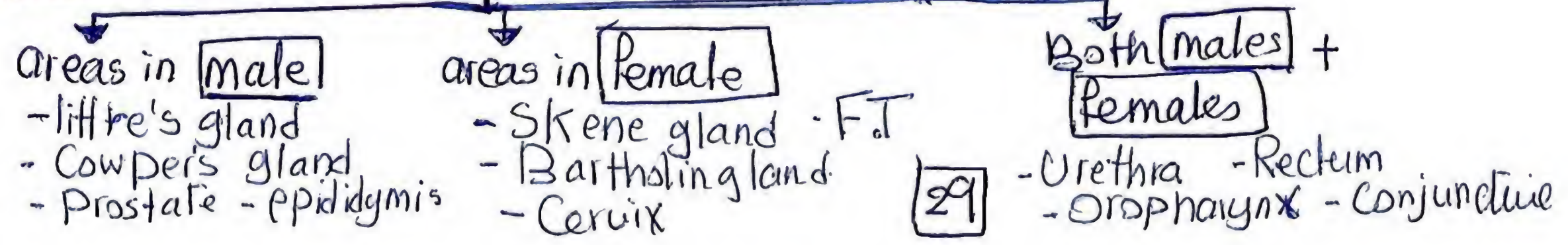
- Gonococcal
- non-Gonococcal
- lymphogranuloma venereum
- Chancroid
- syphilis

## Gonococcal infections [gonorrhoea]

### a. pathology:-

- Neisseria gonorrhoeae :- gram -ve non-spore forming Bacteria arranged in Pairs (Diplococci) with adjacent sides are flattened → giving them kidney-shape appearance
- ch-ch → Twitching motility  
→ affinity for Columnar epithelium
- The main sites of affection are those lined by the "Columnar epithelium"

### The affected areas include the following:-



### The Virulence Factors :-

#### 1- Pili :-

- Fine slender hair-like structures that enable the gonococci to attach themselves to Columnar epithelium
- So they can resist being swept away by the urine or mucous secretion
- Pili show → antigenic variations that make the production of effective vaccine against gonococci → Difficult



## 2 - Production of Endotoxins:

- Gonococci → contain lipopolysaccharides in their membrane and have Endotoxin Activity + Toxic effects on cells.

## 3 - Inhibition of Host immunity:

- Gonococci proteases → can inactivate the host immunoglobulins specially IgA secreted at the mucosal surface.
- They help the gonococci to Resist Host immune mechanisms.
- Marked variations of the outer membrane proteins (Protein II) in (Phase Variation Process)  
↓  
is another Factor that makes the immunity weak.

## ● Pathological Effects on mucosa. (27)

1 - patchy Destruction of mucosa :- Result in  
↳ Burning micturition  
↳ Painful symptoms

2 - Polymorphonuclear leukocytes in Submucosa; Result in:  
↳ Pus formation  
↳ Discharge (less in female)

3 - Production of fibrous Tissue (Response):  
- in chronic non-treated cases → Fibrosis is the end Result with Obstruction in epididymis or Fallopian Tubes. → Infertility in males, female

## ● Mode of infections:-

● Adult:-  
Contaminated towel

### A. Sexual mode

- Heterosexual :- try site = Urethra.
- Homosexual :- try site = Rectum
- Orongenital :- try site = Pharynx

towels  
lavatory seats

### B. Non-sexual

● neonatal → Ophthalmia neonatorum

From mother during delivery

● Childhood → Vulvovaginitis



## b. Clinical picture:

balanitis → infl. of glans penis  
posthitis → inflam. prepuce.

### I - CP in Males:

#### ↳ Uncomplicated Cases:

##### Symptoms

- after IP (2 days - 2 weeks)

The ptn complain of:

- 15% → Asymptomatic
- Micturition Symptoms → in form of
  - mild burning
  - severe Dysuria
  - Urgency
  - Frequency
  - Terminal Hematuria

If post-urethritis

- Urethral Discharge → may be
  - profuse
  - yellow
  - purulent
  - scanty
  - mucoid → Resembling non-gonococcal

##### Signs

- Penis:-
  - Inflamed swollen Urethral meatus
  - Discharge oozing from it
  - Tenderness along the course of urethra

##### • Inguinal Lymph nodes:

- Slight enlarged - Tender

##### • The 2 glass Urine Test:

- show → Haziness - Pus Threads in the 1st glass

[in anterior urethritis]

- Pus in second glass

[in posterior urethritis]

## ⊙ Complicated Cases <sup>(28)</sup>

### 1. Related to Penile Skin:-

- excessive Discharge → balanitis in non-circumcised male → posthitis

- These complications are Rare But →

The glans and prepuce protected By st. sq. epithelium - while the gonococci have affinity mainly for Columnar epithelium.

- Penile
  - lymphangitis
  - edema.
  - marked swelling of penile skin → Bull-head clap Syndrome

- non-gonococcal urethritis
- Genital Herpes

[31]



## 2- Related to Urethra :- Urethra + periurethral tissue

- acute inflammation & soft tissue infiltration.
- If the condition → Neglected,
  - ↳ periurethral abscess
  - ↳ severe pain & swelling of penis
- The abscess → should Drained By → Aspiration not By incision
- If its Neglected or incised → leading to Urethral fistula → open on the perineum By → multiple opening giving → "Watering-Can perineum"
- in the Neglected cases OR Cases with Urethral irrigation by antiseptics →
  - ↳ Fibrosis of Urethra
  - ↳ periurethral tissue

Stricture Urethra

Weak stream  
retention  
of urine

- in Long standing Cases → Carcinoma on top of stricture

## 3- Tysonitis :-

- may be Asymptomatic
- Or :- Swelling on either side of frenulum
- Diagnosis Confirmed By → Urethroscopy :- inflamed openings & their Ducts

## 4- Littreitis :-

- inflamed glands → feels as multiple tender swelling along the roof and side of Urethra.

## 5- Cowperitis :-

- ↳ Fever
- ↳ painful defecation
- ↳ painful swelling palpable on either side of median raphe of perineum
- They can be felt Between the thumb on the perineum and the index finger in Rectum



## 6 - Prostatitis :-

- ↳ Fever ↳ micturition symptoms
- ↳ upto Terminal haematuria
- ↳ painful defecation, Constipation
- ↳ P.R Examination : (è extreme Caution)
  - Tender swollen prostate
  - it's Contraindicated in → If There is possibility of prostatic abscess OR Severe Urethritis
- ↳ Two glass Urine test →
  - Haziness in Both glasses

## 7 - Seminal Vesiculitis :-

- \$ similar to Prostatitis +
- Haemospermia → They are felt During P.R. examination as the Tender structures above the prostate

## 8 - Epididymitis :

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- Symptoms : → acute pain in scrotum - Swelling  
↓  
Pain may radiate to Lower abdomen.
- The epididymis → tender, swollen
  - ↳ groove separating it from the testis
  - ↳ if Testicular involve → Epididymo-Orchitis
- Caused by : → Spread of infection from the prostate OR posterior Urethra along Vas deferens with Urethral instrumentation OR prostatic massage During Acute gonococcal attack
  - ↳ obstructive infertility D.t Fibrosis at The epididymal tail.

## II - CP in Female ≡ ::::

### ↳ Un-complicated Cases :-

33



## Symptoms

- after IP (2 days - 2 weeks)

ptn complain of:-

• 50% Asymptomatic

• Micturition symptoms.

Form of → mild Burning micturition  
→ severe Frequency - Urgency.

If The trigon of the bladder involved.

• Genital Discharge Correct

Term than Vaginal Discharge.

Because the Discharge is from  
Cervix or Urethra Not Vagina

## Signs:

Urethral meatus	Cervix	Inguinal L + N
- Inflamed	- enlarged	- slight
- pus from it	- Congested	Enlarged
	- mucopurulent Discharge	- Tender

## → Complicated Cases :-

1. Related to Skin - Mucous surface Vulva  
Vagina  
Rectum

- excessive Discharge Rarely leads to → Vulvitis

- very Rare in adult female  
as the vulva and vagina → under hormonal control  
are protected against gonococci → which have  
affinity for Columnar epithelium only

- The Rectum → may involved from → excessive discharge  
→ menstrual Blood.

→ Proctitis & Discharge & tenesmus

2. Related to Urethra :- abscess  
Fistula  
Stricture

= males

- There may be Periurethral abscess → Urethral  
Fistula + Stricture



### 3- Related to Glands:

- The racemose nature of Cervical glands → Help the Chronicity of the infection in The Cervix & Formation of "Nabothian follicles" → Bluish cysts Resulting from Obstruction of the Ducts of these glands

- Skenitis: → Dysuria

↳ Drops of pus on milking of urethra with swelling on either side of the urethra felt by index finger in Vagina

- Bartholinitis: → severe pain that prevent sitting or walking

→ marked swelling. Redness of the Lower third of the Labia majora  
→ Can felt Between the index finger in the vagina and Thumb on Lower third of Labium majas.

→ Pus can expressed from opening on the inner sides of labia minora

### 4- Related to Internal Organs: (32)

- in old neglected Cases → The infection Spread to

- Endometrium
- Fallopian Tubes
- Peritoneum

Leading to → pelvic inflammatory Disease.

III - Cp in Both → Males  
→ Females

↳ Extragenital Gonorrhoea:

#### 1- Gonococcal Conjunctivitis:

- Result of → contamination with the fingers or the towels

- manifests →

- by swelling of eyelids
- purulent Discharge
- Conjunctival injection
- Keratitis - Corneal ulceration



## 2- Oropharyngeal gonorrhoea :-


- Result of: Oro-genital contact. Between males - females
- Common in: male homosexuals.
- Clinically:
  - Sore throat.
  - mucopurulent exudate
- The inflammation involves:
  - lips • tongue • the palate • Uvula.

## 3- Rectal gonorrhoea:-

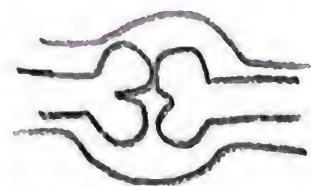
- Occur in men
- Result of → anal intercourse among homosexuals.
- up to 50% of women with gonorrhoea may have ano-rectal infection
- Due to: genital Discharge
- Not necessarily from intercourse
- The infection → Asymptomatic

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## ↳ ① Disseminated (Metastatic) :- Gonorrhoea :-

- 1- Gonococcal Iridocyclitis :- Inflammation of IRI's and ciliary Body
-  Result of: Blood spread only  
[in contrast to conjunctivitis that occur by direct contamination]
- it's a → Hypersensitivity Reaction

## 2- Gonococcal Arthritis :-



- Common in → Female informal → Suppurative arthritis
- Start with
  - Acute onset High Fever
  - Severe arthralgia
  - Hot Red skin over the joint and Swelling of the joint D.t. inflamed synovial membrane.
- it affect → the Large joints send by Their Destruction and ankylosis
- X-ray → Destruction of the Cartilage and narrow joint space
- Aspiration, Culture → Diagnostic



### 3- Gonococcal Perihepatitis

[Fitz. Hugh. Curtis Syndrome]

- Result from → Blood spread (female, male)
- ↳ peritoneal spread (female only) along Fallopian Tube Through Their Direct continuation with the peritoneum.
- manifest by → Acute onset fever
  - ↳ Nausea
  - ↳ Pain in RE upper abdomen that may Radiate to the shoulder ↑ by Cough.
- Differentiated from → other causes of Acute Abdomen.
- Complicated By → Violin-String adhesions Between the liver and Diaphragm

### 4- Gonococcal Dermatitis

- Constitutional symptoms → Fever
  - ↳ Skin eruption
  - ↳ Headache
  - ↳ Arthralgia
- (Bilateral symmetrical vesicular or pustular lesions on erythematous patches)

- M.M lesion → Oral vesicles, ulcers.
- lesion caused by → embolization of Capillaries with gonococci and Release of their endotoxins after phagocytosis

### 5- Gonococcal Septicemia

- occur in → immunocompromised Host
- manifest by → Mild Form with
  - ↳ Skin Rash
  - ↳ Fever
  - ↳ arthritisor Severe Form with
  - ↳ meningitis
  - ↳ Carditis
  - ↳ Hepatitis
  - ↳ osteomyelitis

### \* Factors that help Disseminated gonococcal infection :-

- Host Factors
  - Presence of Menstruation
  - absence or weak complement
  - Presence of circulating Immune complexes

Organism Factor
  - ↳



## Organism Factor

- according to Auxotype: AUT Type that need → arginine, Uracil, Hypoxanthine in nutrition
  - They are Highly sensitive to penicillin
- according to Antigenic Type:
  - marked Resistance to bactericidal IgM in the serum Directed towards their lipopolysaccharide endotoxins.

## IV. CP of Infants, children

### ↳ Eye infection: [Ophthalmia Neonatorum]



• appear as: purulent Discharge From eye of infants in the first 21 days from birth.

- its Responsible for 20% of Cases in the first week
- Chlamydia causes 80% of Cases in the 2nd - 3rd week

- lids → swollen • conjunctiva → Congested (34)
- Periauricular L.N → enlarged
- Pus → oozing • CNS → invasion.
- Corneal → Ulceration, Blindness
- treated By → Local, Systemic Antibiotics.

### ↳ Genital infection:

- occur in Boys → as a Result of Child Sexual abuse.
    - ↳ leading to:- Dysuria, Urethral Discharge, Proctitis
  - occur in girls → Not Child abuser
    - ↳ Indirect:- Contaminated towels and Lavatory seats.
  - The prepubertal thin Vagina → help invasion of the organism.
    - ↳ Severe Vulvovaginitis
- plus the usual picture of adult Female:-
- Dysuria
  - genital Discharge • Proctitis



# C. Laboratory Diagnosis

## A Stained Smear

Urethra

Cervix - Pharynx

Rectum - Conjunctiva

- material for culture from:
- 4 hrs from the last Micturition.

- platinum or Calcium alginate swabs used by → rotating their ends gently inside the Terminal 2-4 cm of Urethra or ends Cervix

- Cotton swabs Not used

Do not → bactericidal effect of their Free fatty acids that may kill the fragile gonococci and prevent their subsequent culture

- 2 specimens are necessary:-

→ First one → for stained smear  
→ 2nd one → for Culture.

- The material for the smear should be spread gently over the slide to avoid distortion of cellular morphology.  
air-dried & heat fixed  
finally → For oil immersion lens exam

- Stained smear :- Gram, Methylene Blue, Immunof.
- Culture :- Transport, Growth, Transport and growth
- Antibiotic sensitivity Test :- Disc, Tube, Chromogenic.
- Biochemical + nutritional: Oxidase, Fermentation, Auxotyping
- antigen, gene detection: ELISA, PCR, LCR.
- Serological Tests

## The stains

- ① Gram stain: gonococci appear as kidney shaped gram -ve diplococci found both inside - outside

The polymorphonuclear leukocytes

- They have to be differentiated from:-

↓  
Denatured  
Staphylococci

↓  
Short  
Coliform  
Bacilli

↓  
Moraxella  
Acinetobacter  
group

- Technique of gram staining:

1- Stain with 1% Crystal violet (20 sec)  
Then Rinse with water

2- add gram's iodine (20 sec) Then Rinse with water

3- Remove the stain (Decolorize) with alcohol  
Then Rinse with water

4- Counter stain with neutral Red & examine smear



## ② Methylene Blue stain:

- Staining of the smear w/ Methylene Blue is more Rapid Than Gramstain
- Disadvantages → inability to show the gram staining properties of the gonococci  
→ The need of special conditions for preservation of methylene blue.

## ③ Immunofluorescence staining:-

- Some Fluorescent Dyes as (fluorescein isothiocyanate) can be conjugated w/ immunoglobulins to form "Conjugate"
- When gonococci React w/ this Conjugate → they can be detected by the resulting fluorescence under Ultraviolet microscope
- The Advantages:
  - The sensitivity
  - The ability to detect even the killed gonococci

40

## • Disadvantages:-

- Cross Reaction with meningococci (Low specificity)
- They are Not useful in Follow-up as They can't differentiate The Viable from non-viable gonococci

## B Culture:

- \* The High sensitivity and specificity of the Combination of Gramstain and Culture → make the "Routine use" of other tests unnecessary, and indicated only in selected cases.
- \* The High Diagnostic value of "Smear-Culture" Combination :-

Source of Sample	Diagnostic sensitivity	
	Gram stain	Culture
1-Symptomatic male	98%	98%
2-Female, Asymptomatic male	40-60%	95%
3-Conjunctiva	95%	95%
4-Pharynx, Rectum, Blood in Disseminated infection	Not Recommend	25-75%



- From table → The indications for Culture are:-
- Female Cases
  - Asymptomatic male Cases
  - extragenital - Disseminated gonococcal inf.

## Types of media:

### 1 Transport Medium (Stuart)

→ The gonococci Remain viable in this media for (1-3 days)

→ It's Formed of → Screw capped bottles that contain

- Agar
- Sodium hydroxide → to neutralize the acid
- Thio glycolic acid → (1:100) Reducing agent
- Buffers → 1% glycerophosphate + Calcium chloride 1:10000
- Methylene Blue :- as indicator for Reduction
  - If medium Turn Blue → it's Unfit
  - If it's Colourless → fit for culture

[4]

### 3 Trans-growth medium

Biological environment Chamber

- contain Both the Requirements of the Transport and growth
- Formed of: pocket-sized plates contain
- Thayer-Martin medium
- CO<sub>2</sub> generating Tablets + paper strips impregnated in Oxidase agents

### 2 Growth Medium modified Thayer martin

- medium enriched with Chocolate agar + 5% CO<sub>2</sub>
- PH → 7.5 + 70% moisture - 36°C temperature.
- It Become Selective By addition of :-

- Vancomycin → 5 µg/ml → to inhibit gram +ve organism
- Na Colistimolate → 7.5 mg to inhibit gram -ve org
- Nystatin → 12.5 mg/ml to inhibit yeast
- Trimethoprim → 5 µg/ml to inhibit proteus

→ after 48 hr incubation → The Colonies appear as glistening white soft Rounded (0.5 mm - 2 mm) Colonies that are 4 Types :-

- Type I - II → Small pigmented Colonies, pathogenic as they contain pili
- Type III - IV → large - non pigmented colonies Non pathogenic



# Antibiotic Sensitivity Test:-

- These Tests are essential D.t. → the Rapidly ↑ incidence of Relative OR absolute resistance of *Gonococci* to most of Antibiotics

## 1-Disc method:

- Disc Containing the antibiotics to be tested are used followed by measuring the Diameter & the area of inhibition of the growth of the organism around the Disc.

- This area is transformed into minimum inhibitory concentration (MIC) by a standard Curve.

- *Gonococci* that require (0.125) µg/ml or more as (MIC) of the antibiotic for growth inhibition

Concerned → less sensitive. OR  
→ Relatively Resistant  
To this antibiotics

## 2-Tube Dilution Method: (38)

- Same idea of the Disc method
- But serial Dilutions of the antibiotics are used in tubes.
- it shows the relative Resistance of *Gonococci* to antibiotic  
(the antibiotic need to be in Large Dose in order to be effective).

## 3-Chromogenic Cephalosporin test

- gonococcal suspension is Mixed with Chromogenic Cephalosporin (that contain B-lactam)

- There will be change in colour of Cephalosporin from yellow to Red colour if the gonococcal strain produces B-lactamase and their Resistance in this condition is total or complete Resistance

(the antibiotic will not be effective even in Large Doses)



# D - Biochemical and Nutritional Tests :

(39)

## 1. Oxidase Reaction :

- Not specific for gonococci.
- Can help in Detection of gonococcal colonies in mixed cultures.
- a small amount of freshly prepared Oxidase reagent :-  
[tetra-methyl-para-phenylene-Diamine HCl] is applied to the suspected colonies.
- Gonococcal colonies turn pink → purple → black within few seconds of application.

## 2. Fermentation Reaction :

- 4 chocolate agar → slopes of glucose, maltose, sucrose, lactose

added to the culture with Phenol Red indicator of acid production (fermentation) → that change, the colour of the indicator from Red to Yellow.

### - The value of this test :-

It can definitely detect *N. gonorrhoea* from sites contaminated & other *Neisseria* as pharynx-Rectum

### ★ The interpretation of the test as follows :-

N. gonorrhoea → Glucose only    N. meningitidis → Glucose Maltose

N. lactamica → Glucose + Maltose + Lactose

N. pharyngis sicca → Glucose + Maltose + Sucrose.

N. catarrhalis → No Fermentation

## 3. Auxotyping :

- Classification system for gonococci that depends on their nutritional requirements for growth.

- Certain strains need arginine, hypoxanthine

[43] Uracil (AUH) → always associated & A symptomatic urethritis in males, great sensitivity to penicillins



## E. Antigens and Genes Detection tests:

### ① Enzyme linked Immunosorbent assay ELISA:-

- test depends on the Demonstration of the gonococcal antigens in the material obtained from the ptn by colour changes in the spectrophotometer
- its Rapid, easy and specific test

### ② polymerase Chain Reaction PCR:-

### ③ Ligase chain Reaction LCR:-

- ②③ these tests depend on demonstration of gonococcal genes.
- The advantages of these tests are easy specimen collection (from urine)
- The Disadvantages are that the Results are Not available as quickly as Gram-smear and Can't provide the antimicrobial susceptibility information of the Culture.

## F. Serological Tests:

- tests depend on the Serological classification of gonococci according to:

- antigenic variation of the proteins in the outer Cell membrane.

- This Can be Done by Co-agglutination Reaction that classified the proteins into Serogroups WI, WII, WIII.

- another Sub-classification of the above types was made By:- monoclonal antibodies

- The main value of these Tests to detect Asymptomatic Carriers in high Risk groups.

- the lack of protective immune response after gonococcal attack and the marked variation in the outer membrane proteins make the Serological Tests for gonorrhoea of very little Practical significance



# d. Treatment of gonorrhoea:

(41)

## A. pretreatment:

1. Advise the ptn to bring the partners for simultaneous treatment and follow up to avoid Reinfection.
2. Advise the ptn to avoid any sexual activity during the period to avoid spread of infection.
3. Advise the ptn to avoid self-examination and continuous milking of the Urethra to avoid traumatic urethritis.
4. Advise the ptn to avoid self-ttt by local antiseptics to avoid chemical urethritis.

## B. Antibiotic treatment:

### • Introduction:

#### 1. Historical points:-

- The gonococci are fragile organisms that can't survive "Outside" human body. except in:-  
Selective culture media
- Rapidly Destroyed By:
  - Heat
  - Dryness
  - mild antiseptics

- The situation is Completely different "inside" the human body with a great tendency to Develop Resistance against most of the antibiotics along their history.

- First :- gonococcal urethritis was treated by (Intraurethral instillation of antiseptic solutions) → Become Obsolete with introduction of Sulpha Drugs in 1930s

- by 1943 → most become Resistant to Sulpha

- penicillin → was used instead

- most of them become Resistant to penicillin

- Spectinomycin → was the Drug of choice for penicillin resistant strains of gonococci

- Finally :- the quinolones derivatives considered the most recent and effective Drugs against gonococci

- There were several Reports of quinolones Resistant strains



## 2-Future points :-

- the ideal antibiotic should fulfil the following criteria:

1. Should be active against gonococci.
  2. Low Cost with easy administration by single oral Dose
  3. It should be safe from Allergy and Toxicity, safe During Pregnancy
  4. should be active against Concomitant Chlamydial infection.
- For concomitant Syphilitic infection → it should either Cure Both → gonorrhoea or Deal only with gonorrhoea → Syphilis to avoid masking of syphilis.

## {1-Antibiotic Regimens}

### Oral Regimens

- Single Dose of one of the following :
- ⊕ Cefixime 400 mg

OR ⊕ Ofloxacin 400 mg ⊕ Ciprofloxacin 500 mg <sup>(52)</sup>

→ any of the above is Combined with:-

Doxycycline 100 mg / twice daily / 7 days  
(for chlamydia)

### Parenteral Regimen

⊕ Single Dose of Ceftriaxone 250 mg I.M.  
↳ combined with Doxycycline 100 mg / twice for 7 days. (for chlamydia)

### Special Consideration

⊕ if ptn allergic to Cephalosporins → use Streptomycin 2 gm I.M.

⊕ if ptn allergic to Tetracycline → use Erythromycin 500 mg 4 times daily for one week or Single Dose of (1 gm) Azithromycin by mouth (for chlamydia)



## { 2. Mechanism of Antibiotic Resistance }

→ No Longer be recommended of:-

(4.8 million units of aqueous procaine penicillin  
+ 2 gm probenecid by mouth to Delay  
Renal tubular excretion of penicillin and  
potentiate its action)

→ Disadvantages:-

- 1- Large painful injection
- 2- Parenteral administration of procaine with liability for toxic procaine reactions
- 3- markedly ↑ Resistance to penicillin that made it unsuitable for the gonorrhea

→ The Resistance to penicillins may  
chromosomally mediated or extra-  
chromosomally (plasmid) mediated

★ Chromosomally mediated:-

→ this Resistance occur against penicillin  
and other antibiotics (tetra, spectinomycin,  
fluroquinolone) [47]

(43)  
- Occur Due to chromosomal mutations  
that lead to partial or Low Level Resistance.  
(The Dose of antibiotic should ↑ to be effective)

→ these chromosomal mutations  
(pen A - pen B - mtr) → may cause this  
partial resistance by ↓↓ the permeability  
of the gonococcal outer membrane to  
penicillin (Not Result in the failure)

★ Extra-Chromosomal (plasmid)  
mediated Resistance

→ occur against penicillin and other  
antibiotics as Tetracycline

→ Due to extrachromosomal DNA particle  
(plasmids) → leads to → Complete  
or total resistance.

(The Dose of Antibiotic will Not be  
effective even its increased).

→ Result in the failure

→ Caused By → production of B-lactamase  
(penicillinase) enzyme by Gonococci  
that Destruct B-lactam Ring of penicillin  
molecule



# C. Complicated Cases:

(44)

## ① Cases of penicillinase producing strains

→ Use one of the following :-

### ••• 2nd - 3rd generations (Cephalosporins)

- 2nd generation (Cefuroxime Na 250 mg IM)

- 3rd generations (Ceftriaxone 250 mg IM)

### ••• Aminoglycosides: 4 gm → female

- Spectinomycin 2 gm (IM) → male

- Kanamycin injection → rarely used to its nephrotoxicity and 8th nerve toxicity

→ its only advantage that it has no effect on concomitant syphilitic infection when Diagnosis of syphilis doubtful.

→ Both Spectinomycin & Cephalosporins → Can be used in pregnant

### ••• B-Lactamase inhibitors:

- Clavulanic acid → inhibits the [48] or tetracycline ointment as most cases have Chlamydia

enzyme B-lactamase produced by the gonococci by binding with that enzyme

- This protect the B-lactam Ring of the penicillin molecule and preserves its efficacy
- Clavulanic acid 125 mg combined with Amoxycillin (500 mg) in one tablet → to protect it
- the Regimen = 8 tablets by mouth that contain 5 gm of amoxicillin in a single Dose.

## ② Cases of Ophthalmia neonatorum:

### ★ Preventive treatment:

- pregnant mother should be checked for gonococcal infection and prophylactic eyedrops or ointment applied to the eye of infants.

- 1% silver nitrate is effective only against gonococci, so better to use Erythromycin or tetracycline ointment as most cases have Chlamydia



## ★ Definitive treatment:

- Carried out to treat the oph. neonatorum
- Due to: potential Danger of → eye perforation  
→ Blindness
- Topical Therapy → No Role alone in ttt.
- treatment Depends on Systemic adm  
administration of Ceftriaxone  
25-50 mg/kg IM. IV in single Dose.  
Dose not exceeding 125 mg.

③ Cases with pelvic inflammatory Disease  
= PID chapter

④ Cases with Abscess Formation

- Include:
  - periurethral abscess
  - Tyson gland abscess
  - prostatic abscess
  - Bartholin gland abscess
- The Ordinary recommended ttt is Carried out addition to Aspiration not incision to

avoid Fistula Formation Followed By: excision later on (415)

- Tetracycline and quinolones are Contra-indications in → pregnancy  
→ Infancy
- There may be cross allergy in phn e-  
penicillin allergy to Cephalosporin

## D. post-treatment measures:

